Bill Thibault

ENVIRONMENTAL ASSESSMENT

OAK PARK VILLAGE

50002911

NATIONAL BIOCENTRIC, INC.
2233 HAMLINE AVENUE NORTH
SAINT PAUL, MINNESOTA 55113
(612) 633-8997

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(612) 633-8997

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April 16, 1976

Submitted to:

City of St. Louis Park
5005 Minnetonka Boulevard
St. Louis Park, Minnesota

By:

National Biocentric, Inc.
2233 Hamline Avenue North
St. Paul, Minnesota 55113

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I. INTRODUCTION

This Environmental Assessment of the Proposed Oak Park Village development has been prepared for submission to the Minnesota Environmental Quality Council by the City of St. Louis Park as mandated by MEQC Regulation 25(b)(2)(jj) which states that an Environmental Assessment shall be prepared for:

> Construction of a new or additional residential development outside any Standard Metropolitan Statistical Area (as defined by the U.S. Census Bureau) that includes 100 or more units in an unsewered area or 500 or more units in a sewered area; or construction of a new or additional residential development within a Standard Matropolitan Statistical Area that includes 200 or more units in an unsewered area or 1,000 or more units in a sewered area;

Oak Park Village will include a maximum of 1,000 new units in a sewered area of a Standard Metropolitan Statistical area.

Preparation of this document represents but one small portion of an extended, on-going process of planning and design of the project.

II. SYNOPSIS

PROJECT DESCRIPTION

The Housing and Redevelopment Authority of the City of St. Louis Park currently owns and is attempting to market an 80 acre parcel of property for development of 1,000 attached residential units and 45,000 square feet of office space. The development will support a maximum resident population of 2,240. The project will be adjacent to Louisiana Avenue, between Walker and West 32nd Streets. The property is the former site of the Reilly Tar and Chemical Company, which was involved principally in coal tar distillation and creosote impregnation. This process constituted an environmental nuisance and ceased operation upon the initiation of legal action by the Minnesota Pollution Control Agency and the City. Considerable planning, on the part of City staff, community residents and design consultants, has resulted in a comprehensive site plan for the development, including five residential parcels, two commercial parcels and 23 acres of open space. In addition, the site has been cleared, graded and improved with storm sewer. Soils on portions of the site were found to be contaminated with creosote residue and an effort has been made to purify them. Questions still remain as to the chemical content of soils and groundwater, with analytic studies currently underway. The project, if fully developed, will have a total market value of approximately $24.2 million. Development is expected to commence in 1976 and be completed by 1983.

ENVIRONMENTAL SETTING

The project will be located on a relatively flat parcel of land with sections of structurally poor soils. Although no natural bodies of water are present, one three acre man-made pond is on the south-central portion of the site, with another 1/2 acre pond just north of the site. The entire area is within the Minnehaha Creek Watershed District.

Quality of groundwater in the area is currently quite good, but the potential exists for contamination from creosote residue left in the soils.

There is very little vegetation on the site and, therefore, little wildlife.

The project will be situated in St. Louis Park, a mature suburban community of 50,000, and will be served by all forms of modern urban infrastructure. There is sufficient capacity in all the City service systems to accommodate the project.

The vacancy rates in St. Louis Park and neighboring communities is quite low. Further, the availability of subsidized housing and housing for the elderly is at a premium throughout the Metrpolitan area. Therefore, the proposed development is viewed as meeting a need, as it will provide a maximum of 1,000 units, 500 of which will be subsidized, with 200 of the subsidized units designated as housing for the elderly.

ENVIRONMENTAL IMPACTS

During the construction stage, the project will generate impacts normally associated with site disruption, including dust, fumes, soil erosion and noise. Safety hazards inherent in the presence of attractive nuisances will also be a factor, but a potential hazard peculiar to this project is the remote possibility of skin irritation from prolonged contact with contaminated soils. All of these impacts can be mitigated.

The overall operational impact of the proposed development will be favorable, in the form of increased housing opportunities, tax revenues and improved aesthetics. Additional vegetation and wildlife will be introduced to the site. Traffic impacts will be negligible. Some roadway noise problems may be encountered, but can be mitigated.

ALTERNATIVES

Alternatives considered include no project, housing of greater or lesser density, commercial or industrial use. All have been rejected.

RECOMMENDATIONS

Two important questions must be answered by an environmental assessment; is the project under consideration of more than local significance, and does the project have the potential for significant environmental effects? Based on information reviewed, it is felt that, in the case of Oak Park Village, the finding is negative in both considerations.

Although housing provided by Oak Park Village will be open to anyone, settlement patterns would seem to indicate that only those with an interest in the St. Louis Park area (western-inner ring) would choose to live there. Impacts of the project will be felt only in its immediate environs. It is, therefore, felt that Oak Park Village does not represent an action of more than local significance.

A potentially serious problem exists concerning chemical contaminants in the soil of portions of the site and areas to the south of the site. Studies are currently underway to determine the probability of those chemical compounds being introduced into the groundwater and, hence, the area's drinking water supply. This situation, undoubtedly, has the potential for significant environmental effects. These effects, however, would not be the result of the proposed project.

The City of St. Louis Park and the HRA will time development of the site to facilitate any curative actions prescribed by MPCA or the Minnesota Department of Health in dealing with this problem. All efforts will be made by the City to eliminate any threats to their drinking water. It is not felt, however, that the preparation of an Environmental Impact Statement on Oak Park Village would aid in that effort. Therefore, in determining that the development of Oak Park Village does not present the potential for significant environmental effects, it is recommended that no Environmental Impact Statement be required or prepared for submission to the Minnesota Environmental Quality Council.

III. PROJECT DESCRIPTION

IDENTIFICATION OF THE ACTION

The proposed Oak Park Village development will be located on an 80 acre parcel of land in south-central St. Louis Park, Minnesota. St. Louis Park is a western, first ring suburb of the Minneapolis-St. Paul Metropolitan area (see Figure 1). Land adjacent to Louisiana Avenue, between Walker and West 32nd Streets will be involved.

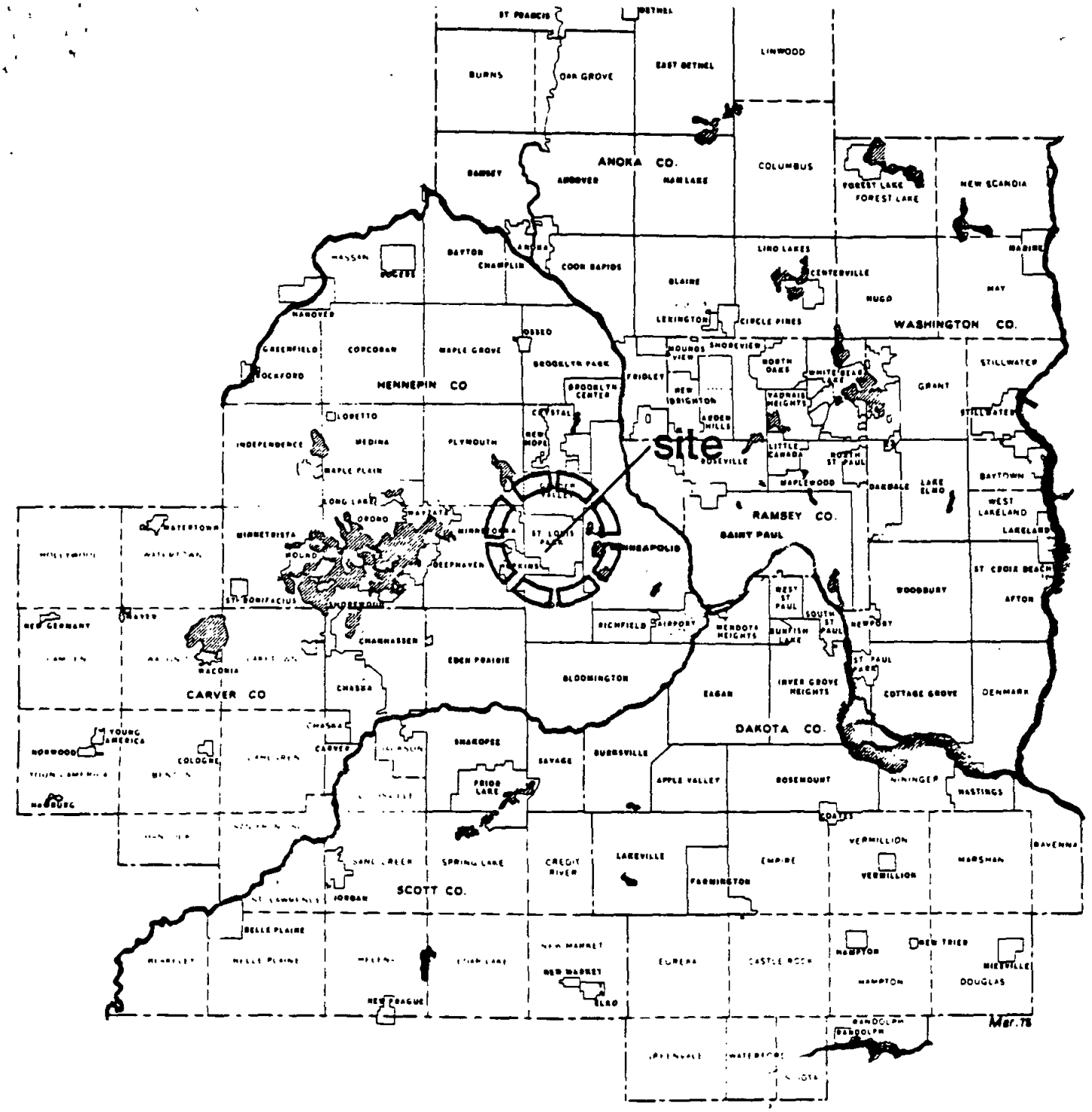
Oak Park Village will consist of a maximum of 1,000 residential units, in the form of apartments and attached townhouses, and approximately 45,000 square feet of retail/office space. Also included will be considerable private, semi-private and public open space. Finally, the area will contain a three acre pond, pedestrian and bikeways, driveways and a minimum of 1,953 off-street parking spaces.

It has been estimated that Oak Park Village, at full development, would have a maximum population of 2,240, for a density of 28 persons per acre or 1,556 square feet per person.

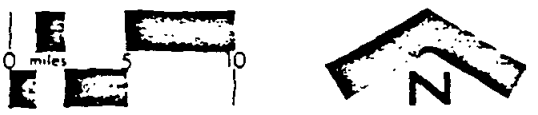
A rather complete and comprehensive site plan has been prepared for Oak Park Village and efforts are currently underway to locate a developer(s) for the project. In addition, the City of St. Louis Park has marketed $2.5 million worth of general obligation redevelopment bonds to terminate obligations with the U.S. Department of Housing and Urban Development, to provide funds for site improvements within the project area, to provide monies for capitalized interest and to pay administrative costs. The site has been cleared and partially graded, and a new storm sewer system has been installed.

ANTICIPATED TIMING

In light of the fact that no developer(s) has, as yet, been secured for implementation of the Oak Park Village plan, it is very difficult to be specific as to the timing of the project. The following table, however, illustrates the most likely time frame:



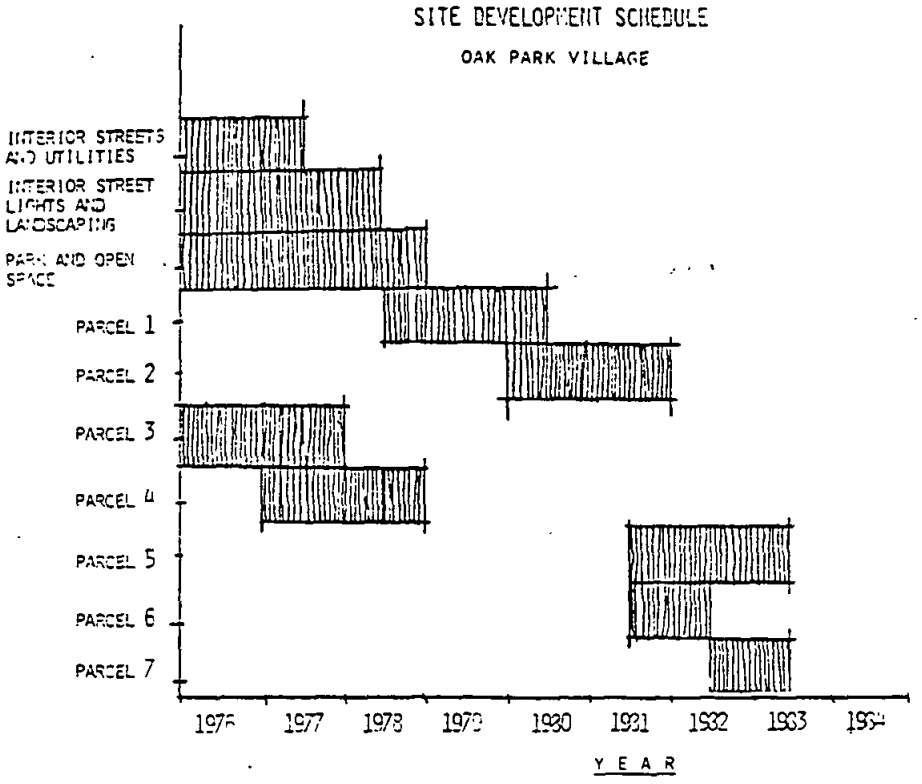
site location



50092920

figure 1

TABLE 1



PROJECT BACKGROUND

The 80 acre location of the proposed Oak Park Village development served, from 1917 to 1972, as the site of the Reilly Tar and Chemical Company and its Republic Creosote works. The company was engaged in the distillation of creosote from raw coal tar, and in the impregnation of wood products with creosote. Various types of lumber, pilings, and railroad ties were treated, under pressure, thereby extending the life of the wood by about 30 years. At its peak, the plant employed approximately 85 people.

The creosoting operation represented an environmental nuisance, and potential hazard, to the St. Louis Park community. Although no air quality monitoring was conducted, two separate odor panels in 1969-71 concluded that air emissions from the plant were objectionable. Although some filtering took place, considerable raw industrial waste was introduced into the soils and natural drainage ways on and adjacent to

the site. In the mid-1930's, a municipal well was abandoned as a result of the foul taste and odor of the water. It is believed that this problem resulted from the presence of phenols, a coal tar component, in the water.

Coal tar is one of the primary products resulting from the destructive distillation or carbonization of certain kinds of coal. Wood preserving oils (creosotes), road tars, industrial pitches and pitch coke are residuals resulting from the distillation of coal tar. Over one-half of the distilled coal tar is pitch and the next largest constituent of coal tar is creosotes.

The Republic Creosote Plant in its 57 years of operation has utilized both coal carbonization and coal tar distillation in its manufacturing processes. Both processes have produced similar and dissimilar organic compounds. Chemical journals have identified 348 organic compounds thus far in similar manufacturing operations.

Two of the major products produced at the old Republic Creosote Plant and their major constituents are:

1. Road Tar is generally made by refluxing back a soft or medium-soft pitch with a mixture of wash oil, drained anthracene oil, and heavy oil to meet requirements of the specifications.
2. Creosote is a blend of oils formulated to meet some specified requirements. Timber preservative creosote is mainly a blend of wash oil, drained anthracene oil, and heavy oil.

Wash oils are a mixture of various alkyl napthalene and quinoline compounds and isomers. Middle and heavy oils are a mixture of phenol homologs, napthalene, acenapthene and fluorene. Anthracene oils are a mixture of phenathrene, anthracene, chrysene and fluoranthene.

Many of the compounds produced during these manufacturing operations have environmental health hazards associated

with them; many are toxic or presumptive carcinogens. Much of the interest in polynuclear hydrocarbons (i.e. anthracene, pyrene, chrysene, and fluoranthene) has arisen because a considerable number of them have cancer producing properties. Some of these compounds are already under consideration in a study to be conducted by the National Academy of Sciences on recommended health-based maximum contaminant levels (Safe Drinking Water Act - P.L. 93-523) due December, 1976.

In 1968, while investigating the site for a proposed storm sewer system, City and Minnesota Pollution Control Agency (MPCA) officials recorded a phenol concentration of .09 milligrams per liter (mg/l.) in the site's runoff. A September, 1969 study, conducted by Hickock & Associates for the City found phenols in soils, groundwater and City wells. In September of 1970, the City and MPCA initiated legal action against the Reilly Tar & Chemical Company to enforce air and water pollution regulations. The case was settled out of court when, in April of 1972, the Company agreed to sell its 80 acres of land to the city and to cease all operations in St. Louis Park. The purchase agreement called for the land to be delivered to the City with all structures, equipment and materials cleared from the site.

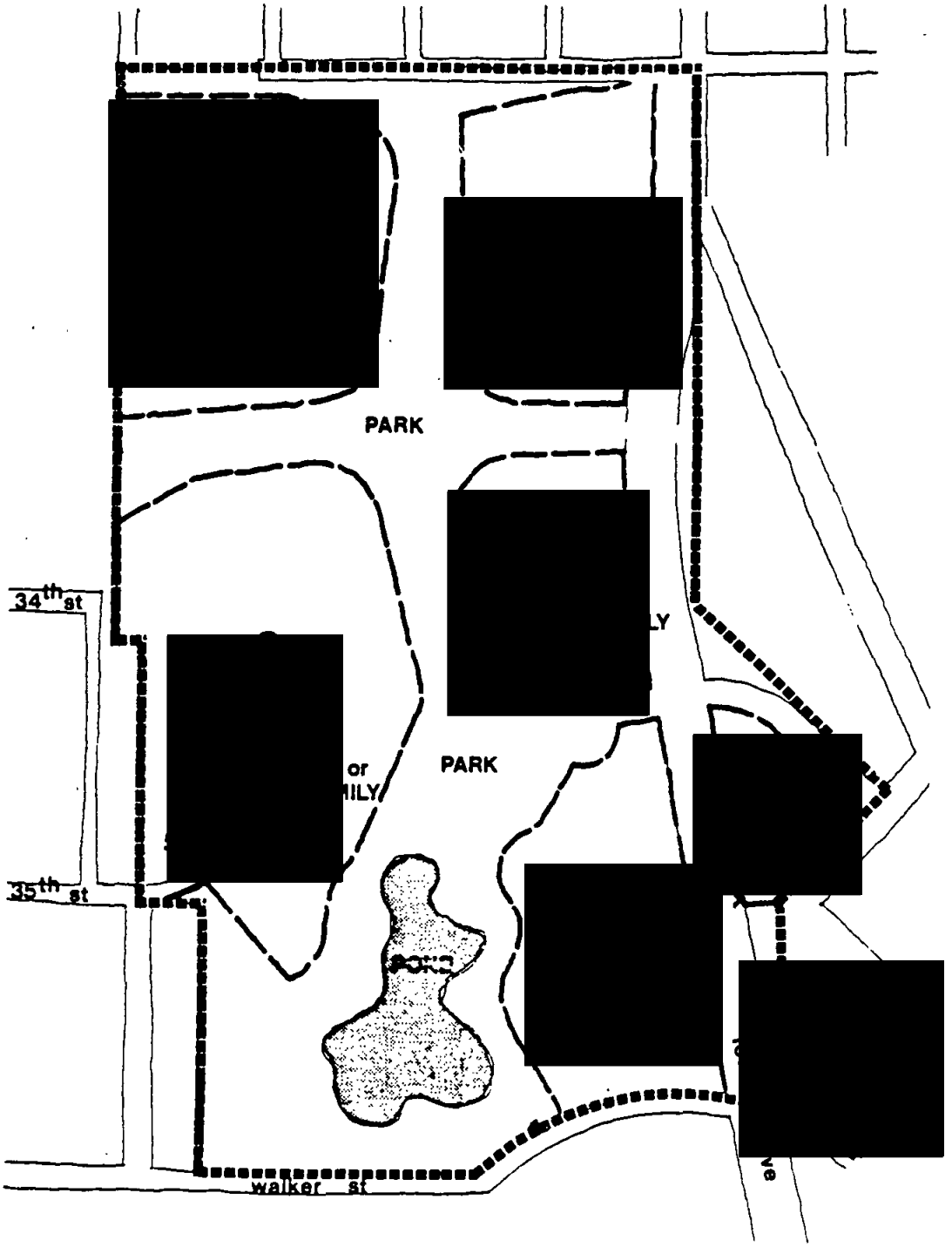
The City then contracted for a number of studies of the site. The engineering firm of Orr-Schelen-Mayeron & Associates (OSM) undertook a feasibility and design study for a storm sewer system to serve the site. They recommended excavation of the southern portion of the site to serve as a ponding area. Because of its high phenol content, MPCA ruled that spoil material could not be dumped or stockpiled offsite. A University of Minnesota Soil Scientist, Dr. G. E. Ham, was called in to assist OSM in the development of a disposal approach. A program known as land farming was implemented, whereby the contaminated soil was spread over the non-contaminated portions of the site, fertilized and planted

grasses (oats, winter wheat, blue grass). Through microbial action and aeration, the soils are rehabilitated. The Mellon Institute was also enlisted in 1971 to use its sophisticated testing capabilities in analyzing the City's water supply. It found no measurable phenols. Finally, a comprehensive soils and groundwater investigation is currently in progress, conducted by Barr Engineering, to be completed by August, 1976.

Having purchased the 80 acre site, the City in June, 1973, sold it to the St. Louis Park Housing and Redevelopment Authority (HRA) for development under the U.S. Department of Housing and Urban Development's (HUD) Neighborhood Development Program (NDP). The purpose of NDP was to eliminate blighting influences on the urban environment and, through a multi-level participatory planning process, promote sound redevelopment practices. The City implemented NDP by funding site improvements, such as the storm sewer system, commissioning consultant studies and organizing and conducting a neighborhood planning process. Community residents, on a number of occasions, met with HRA and City staff to develop and react to various proposals for the 80 acre site. Goals and standards were set, schematics were outlined and finally, in 1975 the design firm, the HODNE/STAGEBERG PARTNERS was hired to participate in the development of the site plans for Oak Park Village. A description of the selected plan follows:

PROJECT COMPONENTS

Oak Park Villabe will consist of a maximum of 1,000 residential units and 45,000 square feet of office space. The 80 acre site is divided into five residential development parcels and two office parcels (see Figure 2). At maximum development, the content of each parcel will be as follows:



site plan

Source: the HODNEY/STAGEBERG partners

figure 2

TABLE 2

PROJECT COMPONENTS - OAK PARK VILLAGE

Parcel #	Acres	Content	Off-Street Parking	Market* Value
1	9.4	100 Townhouses	200	$ 3,000,000
2	13.1	100 Townhouses 100 Apartments	400	$ 5,000,000
3	5.7	100 Townhouses 100 Apartments	400	$ 5,000,000
4	3.3	200 Apartments	400	$ 4,000,000
5	7.5	300 Apartments	260	$ 6,000,000
6	2.1	25,000 sq. ft. Office	163	$ 675,000
7	1.7	20,000 sq. ft. Office	130	$ 540,000
Totals	42.8		1,953	$24,215,000

*Based on the following average values: Townhouse $30,000/unit; Apartment $20,000/unit; Office $27/sq. ft.

One-half of all the residential units will be subsidized and made available to low and moderate income families and individuals. Subsidization will likely be provided under Section 8 of the Federal Housing Act, 1974. Approximately 200 of the subsidized units will be designated as housing for the elderly.

All residential units will be attached, either in an apartment format or in clustered townhouses, with the number of bedrooms varying to serve a variety of family sizes. Parking will be provided either under the residential structure or adjacent to it in garage facilities. Private or semi-private open space will be available to each unit, with all residential structures oriented toward the approximately 23 acres of public open space separating the parcels and bisecting the site. Amenities such as bluff lines, tree stands and the ponding area will be highlighted. Due to their proximity to existing residential areas, structures in parcels 1, 2 and 3, will be limited in height to four floors. Height in other parcels will be limited only by floor area ratio standards (0.7).

Vehicular access to the site will be provided via three cul-de-sac entrance ways off of Louisiana Avenue to the east and an extension of Pennsylvania Avenue to the west. These entrance drives will empty into parking facilities on the site periphery. Interior site circulation will be available to pedestrian and bicycle modes and linked with walk/bike-ways to the west (Oak Hill Park) and to the pedestrian-bicycle bridge crossing Louisiana Avenue to the east.

All services and utilities will be available underground in dimensions sufficient to serve the development design population of 2,240.

The land, which is owned by the St. Louis Park Housing and Redevelopment Authority, is currently being marketed for development. The site may be developed either in total by one concern, in single parcels by seven developers or in a combination. A residential market feasibility study had indicated that rental apartment-type units would have the best chance of early, rapid success in terms of occupancy. It is therefore likely that parcels 4 and 5 will be developed first. No developer has, as yet, been secured for the project.

The land value of the seven parcels is estimated to be $1,109,000 or roughly $.56 per square foot. Actually, the square foot value varies, depending upon potential use, potential intensity of development, and location. The project will have a market value of over $24.2 million upon completion, if developed to its maximum potential. A more realistic assumption is 2/3 to 3/4 development.

RELATED PROJECTS

Two capital improvement projects recently undertaken by the City that relate closely to the proposed development include the extension and upgrading of Louisiana Avenue and the construction of a storm sewer system to serve the site.

The Louisiana Avenue Project was begun in the late 1960's and is 3/4 complete. The project entailed widening

the roadway to two lanes in each direction (north-south) with a boulevard divider. The roadway now extends from Trunk Highway #12 north to Walker Avenue and from Oxford Street to Excelsior Avenue to the south. The final segment, Walker Avenue to Oxford Street is scheduled for completion in 1978.

The storm sewer was completed in 1975, having been funded by Neighborhood Development Program monies. The system eliminates on-site drainage problems that had been experienced, and expedites the removal of runoff to minimize leaching through possibly contaminated soils.

IV. A. PHYSICAL SETTING

TOPOGRAPHY

With three exceptions, the general topography of the site is gently rising from south to north, from a low of 890 feet mean sea level, to a high of 900.3. The exceptions are a 6 1/2 foot knoll in the east-central portion of the site and steep 15' embankments along the western and north-eastern boundaries of the site. The low areas in the south-central portion forms the storm-water ponding area. The site's north to south decline facilitated the discharge of wastewater and industrial waste from the creosote operation.

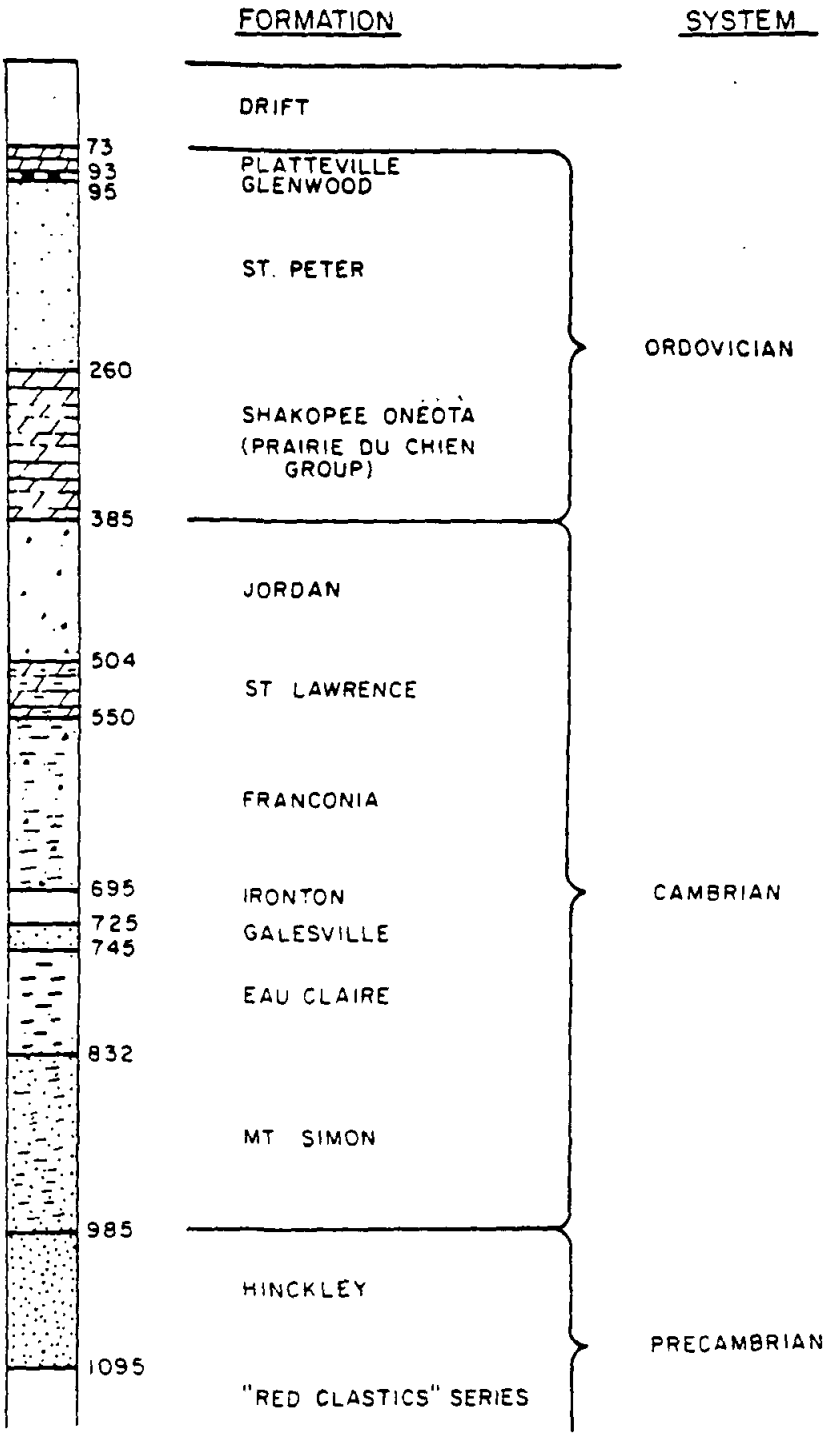
GEOLOGY

Based on well drillers logs, Minnesota Geological Survey scientists have determined the minimum depth to bedrock in the City of St. Louis Park to be 50 feet. Drift thickness on the proposed site is estimated to be 50-100 feet. The first layer of bedrock encountered at that depth consists of limestone, in the Platteville-Glenwood Formation. This limestone layer is estimated to be about 20 feet thick, and is underlain by approximately 170 feet of sandstone in the St. Peter Formation. About 40 feet of Dolomite, constituting the lower Ordovician Prairie du Chien group, supports the St. Peter strata. (See Figure 3, STRATIGRAPHIC COLUMN).

No active faults are known to exist in or around the City. It is generally felt by Minnesota Geological Society scientists that the St. Louis Park area is tectonically stable.

SOILS

Soil subsurface borings were conducted in December of 1969 to analyze soil types from the surface to a depth of approximately 25-50 feet indicated (following subsurface soil description east to west, north to south):



stratigraphic column

Source: G.M. Sunde – Engineer

50022930

figure 3

The eastern third is roughly from the surface to a depth of 25 feet, sand and gravel over three-quarters of the north-south portion with the remaining south-eastern portion having approximately 4 feet of fill, loam top soil, cinders and tar material all underlain by 20 feet of medium to coarse sand and gravel. The subsurface ground water level is at a depth of 9 to 15 feet.

The north-central portion of the site from the surface to a depth of approximately 13 feet is fill, fine sand and gravel; the mid-central portion to a depth of 4 to 6 feet is fill, fine sand and gravle; the south-central portion to a depth of 3 feet is fill and fine sand followed by 10 feet of peat and muck. All of the central portion is underlain with medium to coarse sand and gravel to a depth of 25 feet. The subsurface ground water level is at a depth of 9 to 10.5 feet.

The north-western portion of the site from the surface to a depth of approximately 7 feet is fill; the western central half to a depth of 4 feet is fine sand and gravel; the south-western portion is fill and fine sand to a depth of approximately 4 feet. All of the above is underlain with medium to coarse sand and gravel to a depth of 25 feet. The subsurface ground water level is at a depth of 8.5 to 15 feet.

Soils on the proposed site represent a problem and an important design consideration in two respects. First, the chemical content of the soil in some portions of the site has been degraded as a result of the operations of Republic Creosote Plant. Secondly, the structural and stress capabilities of the soil on certain portions of the site are rather poor.

Chemical Contamination - The coal tar distillation and wood impregnation process carried out on the site from 1917 through 1972 resulted in the discharge of water distilled

from raw coal, tar and other wastes from the handling of the raw material and the finished material. This discharge drained south, to the natural ponds south of Trunk Highway 7. As a result, phenol or carbolic acid was deposited in varying concentrations in the soil

Soil boring and analyses conducted in April of 1971 indicate that the presence and concentrations of oils in the soil were highest in the surface 2 feet in the south-central portion of the site (7%) and particularly in the former ponding area, south of the site, between Trunk Highway 7 and West Lake Street. Concentrations there ranged from 6% at the surface to 8% at a depth of 25 feet.

Soil borings and analyses conducted in February of 1974 indicated concentrations of oil and phenol in the ponding area, between Trunk Highway 7 and West Lake Street, which is south of the subject site, of 115,000 mg/kg oil and 91.4 mg/kg phenol; while 150 mg/kg (minimum) to 27,000 mg/kg (maximum) oil and "not detectable" to 15.5 mg/kg (maximum) phenol was found at 20-60 feet.

Soil borings and analyses conducted in December of 1974 indicated concentrations of oil and phenol in the ponding area on the southern portion of the site as 390 mg/kg (minimum) to 28,000 mg/kg (maximum) oil and <0.1 mg/kg (minimum) to 1.4 mg/kg (maximum) phenol from a depth of 1/2 to 3 1/2 feet; 346 mg/kg (maximum) to 5,630 mg/kg (maximum) oil and 0.2 mg/kg (minimum) to 0.3 mg/kg (maximum) phenol from a depth of 5 to 8 1/2 feet; and 310 mg/kg (minimum) to 4,190 mg/kg (maximum) oil and <0.1 mg/kg (minimum) to 29 mg/kg (maximum) phenol from a depth of 10 to 13 1/2 feet.

The problem inherent in assessing the potential health hazards associated with these creosote oil deposits has been a lack of qualitative and quantitative information regarding specific organic creosote compounds included in these oil deposits. The phenol concentrations in proportion to the oil concentrations at the various sites and depth

described above, indicate a need for more specific chemical information regarding these deposits. The chemical information sought should address and answer qualitatively and quantitatively the organic compounds in these deposits, the rate of leaching, extent of leaching and the potential health hazards, as well as the extent and degree of contamination.

There is a need for more conclusive information describing the organic compounds present, their concentrations and potential health hazards (toxicity, carcinogenicity, etc.) to ground water and city drinking water. Additionally, the health dangers associated with excavation and removal of subsurface soil containing hazardous creosote compounds should be known if these oily wastes are determined to be potential groundwater and aquifer contaminants.

Barr Engineering Company is presently engaged in a soil and groundwater study on and around the subject site. Phase I of their two-phase work plan is presently being conducted to collect data on the vertical and lateral extent of the creosote wastes to provide input into predicting future impacts on groundwater quality. Additionally, analysis of inorganic and organic parameters at selected locations will be performed to determine potential problems, if the groundwater migrates from the area and into surrounding chlorinated water supplies. Measured indicator parameters in soil samples will be used to determine creosote waste in the soil, and to develop a water quality monitoring program for the study area. Phase I is planned for completion by mid-May.

Phase II will measure the effect of creosote waste deposits on surficial and bedrock groundwater systems, define the interaction between surficial groundwater system and underlying bedrock aquifers and finally predict the future impacts of creosote deposits on groundwater quality. This phase is planned for completion by August 1976.

The City of St. Louis Park has been assured by MPCA officials that Barr's study will address and answer the questions regarding the types of organic creosote compounds, their concentrations and extent of their movement, all of which are necessary to assess future health hazards.

Structural Capability - A total of 23 soil borings were taken in the fall of 1969 to indicate the general foundations over the site relative to establishing property values and for use in a preliminary evaluation of foundation conditions for industrial buildings. Figure 4 shows the location of these borings and the eight subsequent borings taken to investigate the location of Louisiana Avenue and determine the percent of oils in the soils. Soil Engineering Services, Inc. positioned the borings over a grid pattern approximately 350 feet in the north-south direction and 400 feet in the east-west direction.

Generally, the site can be segregated into three areas, and analyzed as follows:

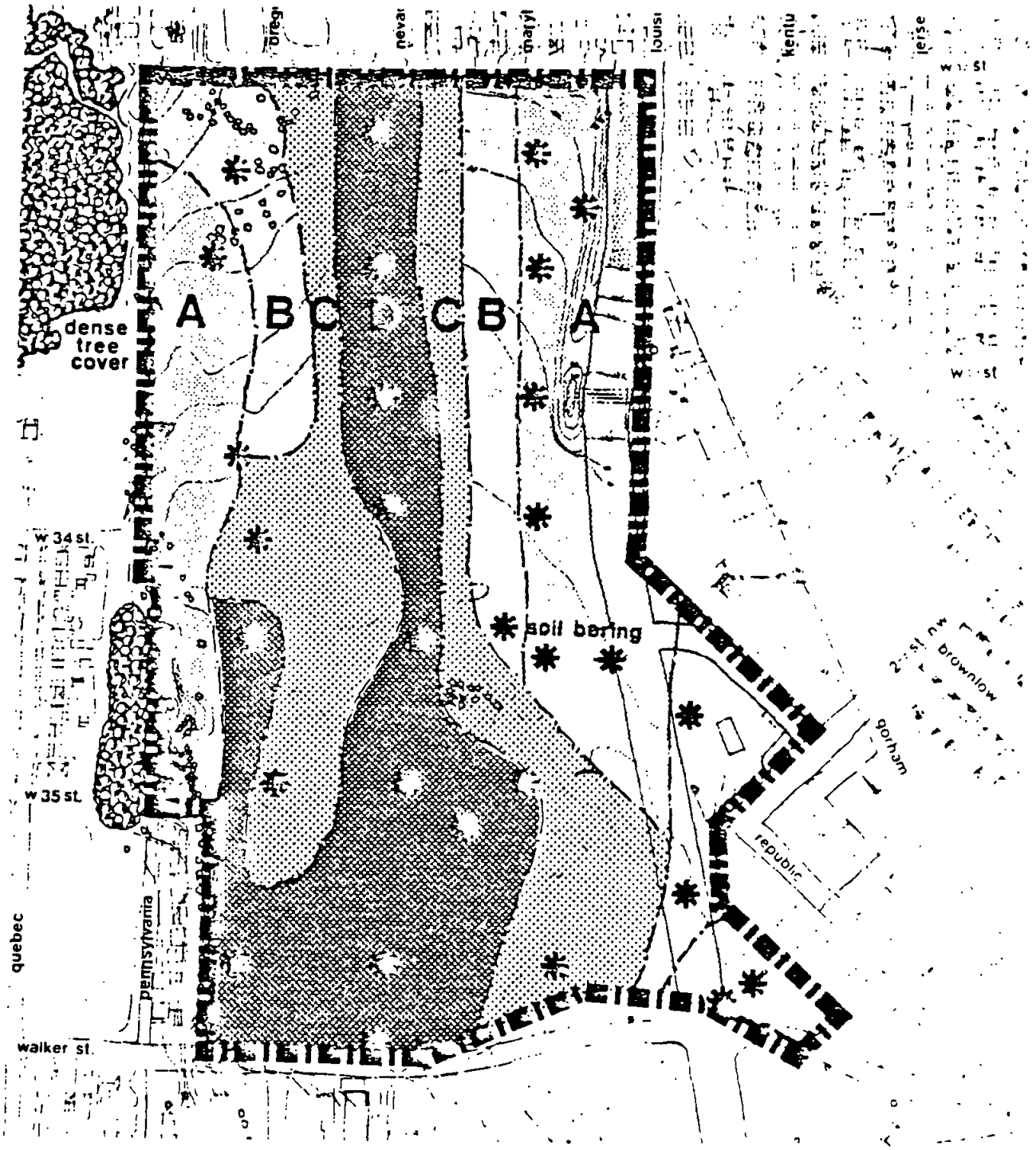
1. The central section (unsuitable to fair conditions on 50 percent of the site) -- The soil consists of up to 20 feet of organic or soft cohesive materials in place.

2. The east and west sections (good to excellent conditions on 50 percent of the site) -- The soil consists of limited depths (5-10 feet) of organic materials.

After analyzing the logs of the 31 borings, consulting architects made the following recommendations:

Soil	Suggested Foundation	Depth of Organic or Poor Soil	Site %	Site Acres
A*	excavate and backfill	0 - 5 feet	31.7	25.3
B	probable excavate potential pilings	6 - 10 feet	19.1	15.3
C	probable pilings	11 - 15 feet	27.1	21.7
D	pilings	16 - 20 feet	22.1	17.7

*Letter reference keyed to Figure 4.



Depth of Organic or Poor Soil

A	0 - 5 feet
B	6 - 10 feet
C	11 - 15 feet
D	16 - 20 feet

soil stability

0 feet 200 400

N

Source: the HODNEY/STAGEBERG partners

50002935

figure 4

The City requires soil borings prior to any construction. Therefore, complete and detailed soils information will be known, by site, for each of the proposed structures.

GROUNDWATER

The depth to water table on site ranges from 8 to 15 feet. The first aquifer is located in the St. Peter strata at a depth of approximately 95 feet. The Jordan-Prairie du Chien group is found at a depth of 260 to 504 feet. It is from this aquifer that a portion of the City's municipal water supply is drawn. The next major aquifer is the Mt. Simon-Hinckley, providing water for municipal users as well. This strata begins at a depth of approximately 832 feet.

Based on Minnesota Department of Health municipal well monitoring and analysis results, the quality of water in the Jordan and Hinckley strata in St. Louis Park is quite good.

Most of the compounds associated with creosote waste are water insoluble. The behavior of the creosote organic wastes in natural groundwater and aquifer systems is regulated to a large extent by the interaction of the organic waste with the natural organic polyelectrolytes, such as humic acid salts. Natural organic polyelectrolytes are some of the most active components of natural soil-water systems entering into physical and chemical reactions with many other components of the system. Some of these insoluble creosote wastes could also enter in chemical reactions with natural organic polyelectrolytes. Insoluble pesticides, such as DDT, have been shown to solubilize with soluble humic acids.

It is not known at this time whether any of the water insoluble creosote compounds (particularly polynuclear compounds) have entered the groundwater. It is hoped that this will be determined by the Barr Engineering study.

Barr Engineering is analyzing inorganic and organic parameters at selected locations to determine potential problems.

Their emphasis will be placed on predicting the quality of groundwater in the general site and at points of groundwater use.

It was the understanding of St. Louis Park City officials that the Barr Study would be completed to an extent sufficient to determine curative approaches to the possible soil and groundwater problems by January 1976. This would have permitted consideration of study data and recommended actions in the preparation of this environmental report. It now appears that the Barr information will not be available until August 1976.

The City of St. Louis Park has expressed its commitment, through its senior officials, to take action deemed necessary to eliminate the threat of contamination to groundwater in or around the site. The City intends to continue to work closely and in good faith with the Minnesota Pollution Control Agency and the State Department of Health toward that end.

CLIMATOLOGY

Weather in the Twin Cities Metropolitan area is characterized by rather long, severe winters and warm, humid summers. The mean annual average temperature is +46°F, with January the coldest month (+15°F) and August the warmest (+73°F). The area averages approximately 26.7 inches of precipitation annually, with June the wettest month (approximately 4.2") and January - February the dryest (.8"/month). Winds in the area are predominantly from the southeast and northwest.

AIR QUALITY

Sources of air pollutants in the area surrounding the proposed site include industrial activity, various major streets and, indirectly, retail shopping nodes. The Minnesota Pollution Control Agency recently removed one of its sulfur dioxide monitoring devices from St. Louis Park, due to a lack

of any measurable quantities of SO_2 in the air. Inasmuch as all roads in the area are paved and most ground surfaces are vegetated, airborne particulates do not present a problem in and around the proposed site. A 1975 air quality report*, prepared for the Louisiana Avenue extension project, estimated the current (1975) carbon monoxide (CO) reading at the southeastern corner of the proposed site to be 50.8 tons per year or .24 parts per million (ppm). This is well below the MPCA standard for CO of 9 ppm.

SURFACE WATER

Four bodies of surface water are in the vicinity and will be affected by the proposed development. They include the three storm water storage and settling ponds included in the storm sewer system (see Figure 7), and the Minnehaha Creek. The proposed site is situated in the Minnehaha Creek Watershed District.

The three ponds are man-induced storage and settling bodies, located in low areas. The ponds are considered man-made waters by the Minnesota Department of Natrual Resources. No water quality data is available for these ponds.

The Minnehaha Creek is listed as a Class 2B stream by the Minnesota Pollution Control Agency. That classification is defined as follows:

> *The quality of this class of interstate waters of the state shall be such as to permit the propagation and maintenance of cool or warm water sport or commercial fishing and be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable.*

No recent monitoring has been conducted on the Minnehaha Creek and, therefore, meaningful water quality data is not available for this stream.

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*Louisiana Avenue & Highway 7, Air Quality Report, St. Louis Park, Minnesota (1975), Bather, Ringrose, Wolsfeld, Inc.

VEGETATION

The Oak Park Village site is somewhat limited in natural vegetation with the exception of a stand of trees, known as the knoll, in the southern-central portion of the site and scattered trees around the perimeter of the site. An oak-woodland and thicket is found on the 30 to 40 foot grade along the western boundary of the site. The composition of this oak-woodland is burr oak, red oak, an occasional silver maple, and a box elder. The understory thicket consists of greenbrier, hawthornes, currant and gooseberry. Smooth sumac and an assortment of commonly occurring weeds including cocklebur, pigweed, ragweed and grasses (foxtail and brome grasses) is found in the openings where sunlight can reach the ground. Near the base of the grade along the western edge of the site, large and very mature cottonwood trees are found. These cottonwoods range in height from 50 to 60 feet.

The stand of about twenty trees in the central portion of the site, on the knowll, consists of red pine, silver maple and several other trees. Another stand of scattered trees is found in the northwestern portion of the site - these are red oaks and cottonwood, and some occasional smooth sumac. The western half of the site is currently being land-farmed in a winter wheat crop. The eastern half of the site had recently been graded and is virtually void of any kind of vegetation. Along the road which parallels the eastern edge of the site is a ditch, where commonly occurring weeds and wildflowers are found. The species include gumweed, ragweed, Russian thistle, sunflower, pigweed and beggars tick.

WILDLIFE

Wildlife is virtually absent from the site, with the exception of mobile species; predominantely birds. Killdeer and sparrows were noted on the field trip, in addition to some robins. Any other terrestrial species would likely not be

found because of the site's current disruption. The nesting habitat for birds is limited to the woodland along the western boundary of the site and, to a minor degree, the knoll area in the central portion of the site.

IV. B. CULTURAL SETTING

POPULATION

It has been estimated by the Metropolitan Council that the City of St. Louis Park has a current (1975) population of approximately 49,650. City officials agree that the current figure is in the area of 50,000. Table 1, below, presents trends in the City's population growth and includes Metropolitan Council population projections, as promulgated in April 1975:

TABLE 3

POPULATION TRENDS CITY OF ST. LOUIS PARK: 1940-2000

Year	Population	Percent Change
1940	7,737*	-
1950	22,644*	+193%
1960	43,310*	+91%
1970	48,883*	+13%
1980	49,500**	+1%
1990	48,400**	-2%
2000	47,900**	-1%

*U.S. Census
**Metropolitan Council

It should be noted that in 1972, Metropolitan Council projections for the City reflected a steady rise in population to a figure of 55,000 by the year 2000. This demonstrates the general degree of uncertainty experienced in forecasting Metropolitan area growth rates. It is the contention of City officials that the population will approach the City's ultimate holding capacity, estimated to be approximately 60,000, by the year 2000. Based on current cost trends in areas such as energy, transportation and the delivery of urban services, it would seem reasonable to conclude that an established community, such as St. Louis Park, would likely attain full development potential. Population growth will, of course, be

founded on a number of unforeseeable and frequently uncontrollable factors. Therefore, a projected population range of 50,000 to 60,000 for the year 2000 would seem most workable.

The makeup of the City's population, as of the 1970 Census, is partially illustrated in the Figure 5.

Eight percent of the total population in the City is over 65 years of age, while 42% are under 25. In terms of ethnicity, 99.1% of the community is white, 0.2% is black, and 0.7% other. The density of the City (persons per residentially zoned acre) is 10.93 persons per acre.

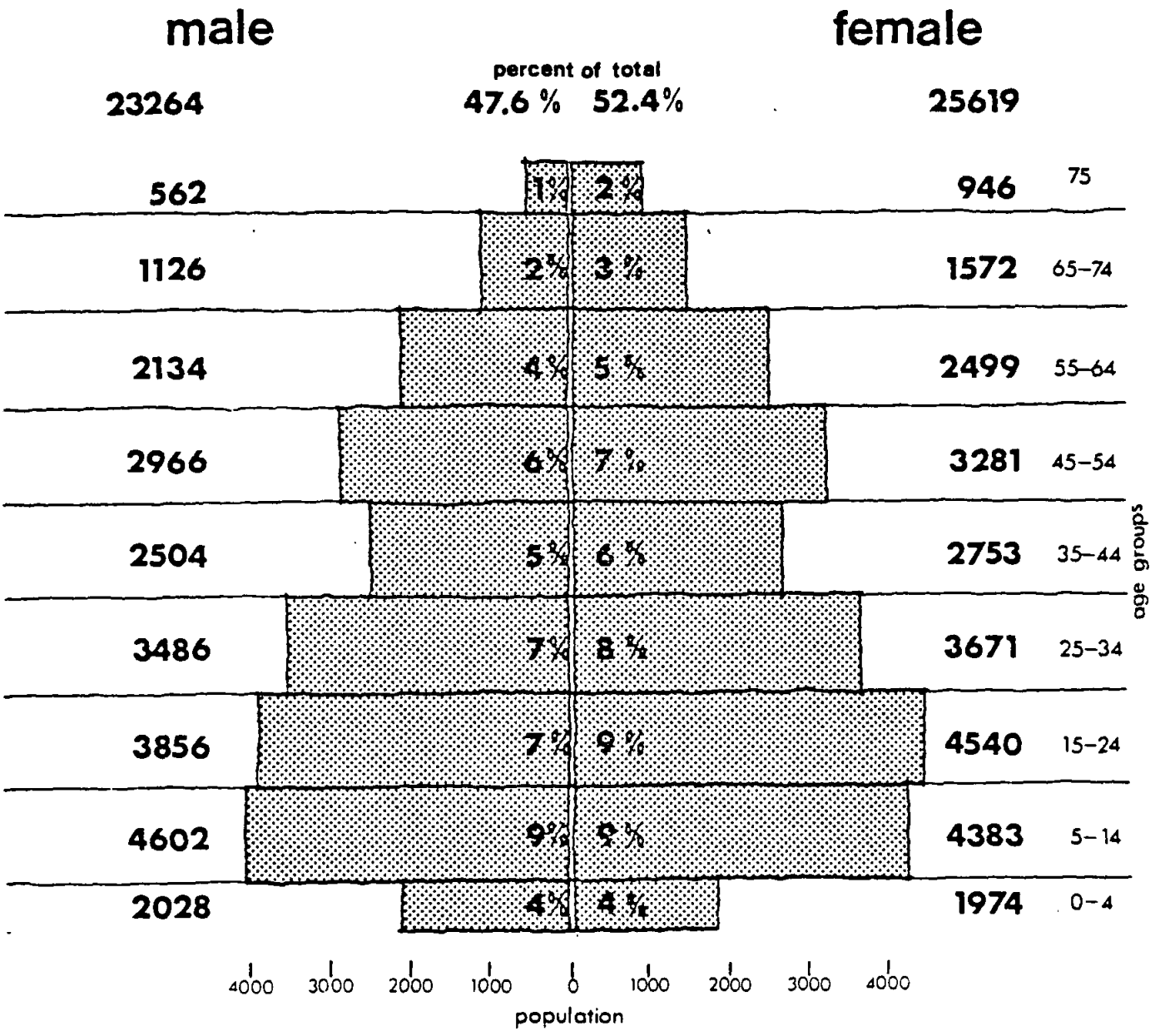
In 1970, the City had a total labor force of 22,534 people. Of that figure, 20,127 or 89.3% worked in Hennepin County. This would seem to indicate that, in St. Louis Park, residential selection is based strongly on place of employment.

The per capita income in St. Louis Park in 1970 was $4,272, with a median family income of $12,483, $801 higher than the Metropolitan area median of $11,682. Families with income below the poverty level accounted for 2.3% of all families in St. Louis Park, while those with incomes greater than $15,000 per year represented 33.1%.

TRANSPORTATION FACILITIES

Roadways - (See Figure 6). The City is directly served by four components of the Metropolitan highway network; U.S. Route 12 an east-west roadway, parallels the City's northern border; U.S. Routes 169-212 serve the southeastern portion of the community; County Trunk Highway 100 transects the community on a north-south axis; and County Trunk Highway 7 runs east-westerly through the city, passing just south of the proposed development site.

The street system in the older sections of St. Louis Park are aligned in basic grid pattern, with modifications for natural or cultural barriers. Major thoroughfares in the vicinity of the site include West Lake Street, Minnetonka Boulevard, Texas Avenue and Louisiana Avenue. The transportation focus

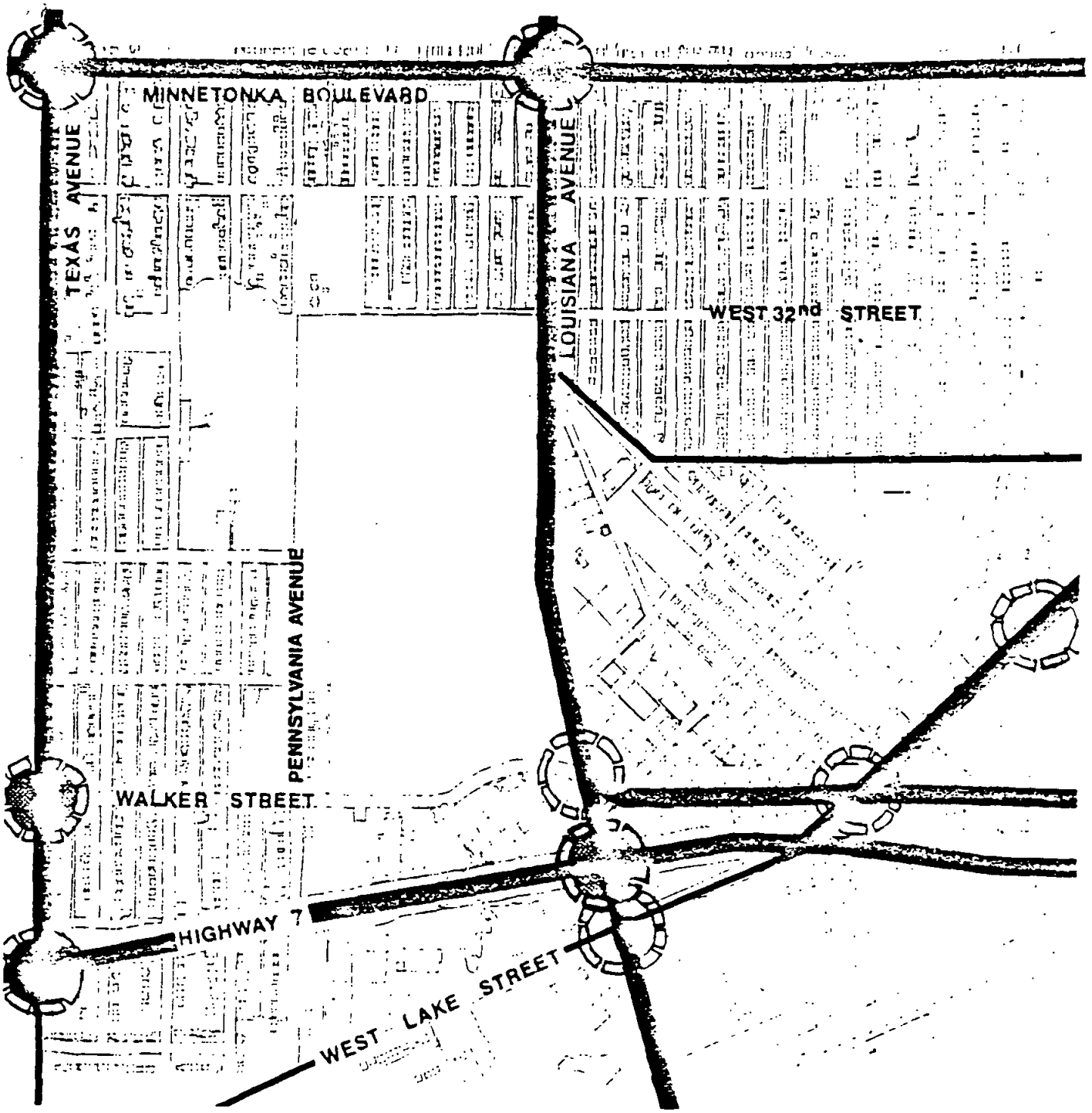


population pyramid st. louis park 1970

Source: U.S.Census

5000029-13

figure 5



major 4-lane streets

collector streets

thru traffic intersections

signaled intersections

roadway location

0 feet 400 800

N

Source: the HODNEY/STAGEBERG partners

5000294

figure 6

of the proposed development will be toward the newly extended and improved Louisiana Avenue. This four-lane boulevard will serve as the City's chief north-south corridor when completed. A southern section is scheduled for construction in 1978. The portion adjacent to the proposed site is complete, with a vehicular average daily traffic (ADT) capacity of 26,000. The current volume (ADT) is 1,300, based on recent (1976) counts. This figure is misleading, however, as volumes are expected to increase to 15,600 ADT upon completion of the southern section. Volumes and capacities on roads potentially serving the site are as follows:

TABLE 4
ROADWAY VOLUMES AND CAPACITIES
ADT - 1976

Roadway	Current Volume	Capacity
Louisiana Avenue	1,300	26,000
Walker Street	2,800	6,000
West 31st Street	850	4,000
Highway 7	22,900	34,400
W. Lake St. (N. of T.H. 7)	7,200	10,800
W. Lake St. (S. of T.H. 7)	660	4,000

It is likely that Pennsylvania Avenue will also be effected by the proposed development. This is a 30' wide interior street on the southwestern border of the site. No volume or capacity figures are available for this roadway.

Bus Service - The Metropolitan Transit Commission will provide bus service to the proposed development, with buses routed along all major thoroughfares in the vicinity of the site. Of prime importance is the fact that service will be available from Louisiana Avenue on bus route number 36. This will provide transportation, either directly or through transfer, to all points of interest in the Metropolitan area.

Pedestrian and Bikeway - The City's Comprehensive Trails Plan calls for the proposed development site, as a portion of its public open space, to serve as a link for both pedestrian and bikeway routes. The site will connect the Oak Hill Park and Aquila School Routes with the public library/high school/ junior high area. A combination pedestrian-bikeway bridge is already in place, crossing Louisiana Avenue.

Fixed Rail Rapid Transit - It is the feeling of City officials that the currently under-used Chicago Milwaukee Rail line may some day serve as a mass transit corridor, linking the western suburbs with the Minneapolis and possibly St. Paul central business districts. This possibility has been proposed to the Metropolitan Transit Commission and is currently under advisement. The rail line is located approximately 1/4 mile from the proposed site.

SERVICE AVAILABILITY TO THE SITE

Potable Water - The City of St. Louis Park draws an average of 7 million gallons of water per day from the Jordan and Hinckley strata via 21 deep wells, located throughout the City. There are no City wells on or adjacent to the proposed site. The water conveyance system has a capacity of 26 million gallons per day. Recent Minnesota Department of Health analysis of the City's drinking water has found it to be of very high quality. Should certain compounds, possibly in the site's soils as a result of the creosoting operation, leach into the aquifer, the water quality could be degraded to an undesirable level.

The proposed site is served by 12 inch water mains paralleling its north, east and southern borders. Water in the pipe has a constant pressure of 62-65 pounds per square inch (psi). The pressure has been approved by fire insurance underwriters, according to City engineers.

Sanitary Sewer - Sanitary sewage from the City of St. Louis Park is carried via the Metropolitan Waste Control Commission's Highway 12 and Minneapolis interceptors to the sewage

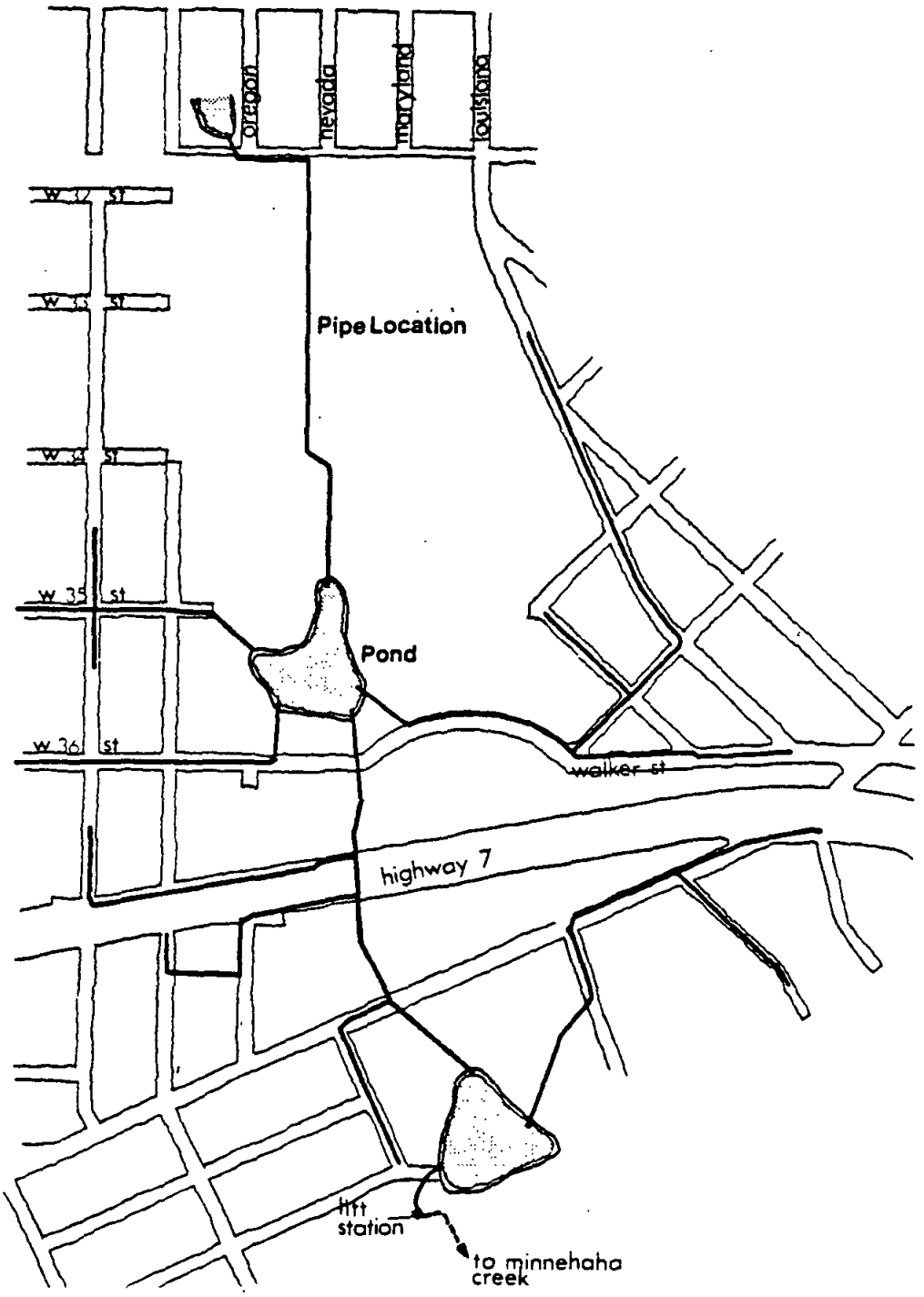
treatment plant at Pigs Eye Island in St. Paul. The plant provides secondary treatment before discharging effluent into the Mississippi River.

The proposed site will be served by lateral lines extending from the 12 inch trunk lines on Walker Street and West 32nd Street. These pipes each have a capacity of 787 gallons per minute (gpm) and are currently handling 98.4 gpm each during peak periods.

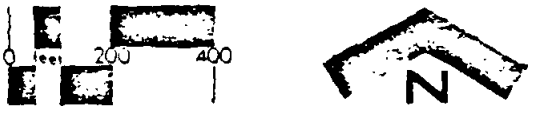
Storm Water Sewer - In an effort to minimize leaching of storm water through the possibly contaminated soils on the proposed site, a comprehensive storm water drainage system has been installed. The system consists of two ponding areas, 18,200 feet of buried pipe and a small lift station with treatment capabilities (see Figure 7). In addition to the proposed site, the system will also drain approximately 470 acres to the north, east and west of the site.

The two ponds included in the system are lined with 30 mil polyvinyl chloride to preclude any seepage of groundwater into the ponds. In addition, the ponds will allow for settling of any sediments in the accumulated storm water. A third, existing ponding area to the north of the proposed site will be incorporated into the system.

The various ponds are interconnected and fed by a network of underground reinforced concrete pipe, with widths of 21" to 60". The site and surrounding area drains, via the pipe network, to the pond in the southern portion of the site. When that pond attains a predetermined elevation, excess water is discharged and flows via pipe under Walker Street and Trunk Highway 7 to the ponding area south of the highway. When that pond achieves the appropriate elevation, the excess water is injected with chlorine dioxide and flows to the lift station adjacent to the Minnehaha Creek, where it is injected with sulfur dioxide and discharged into the creek. The chlorine is added to react to and eliminate any phenols in the storm



storm sewer system



Source: Orr - Schelen Mayeron & Assoc., Inc.

50002948

figure 7

runoff. The sulfur performs the same function on any remaining chlorine.

The City was issued an NPDES permit by the MPCA for this storm sewer system in April of 1975. The permit requires a rather stringent monitoring program and has established the discharge standards, as shown in Table 4.

Discharge monitoring and analysis is expected to begin by mid-April, 1976. At that time, the effectiveness of the treatment system will be determined. The NPDES permit provides for the diversion of storm water to the sanitary sewer system if analysis indicates that standards are not being met. St. Louis Park is committed to adhering to the stipulations in the permit.

Solid Waste Collection - A contract is maintained by the City with private haulers for the collection of solid waste from single and duplex residential units. Multi-family units, such as those proposed for development on the site under consideration herein, must contract separately with a private hauler. This, then, will likely be the responsibility of the development's operator/managers. The majority of St. Louis Park's solid waste is disposed of at the Flying Cloud Sanitary Landfill. This facility has an existing capacity of 2,407 acre feet and an expected life of roughly 5 more years.

Police Protection - The City is divided into four police districts, with each district assigned a police car, manned by one officer (24 hours a day, seven days a week), and a rescue wagon. The wagon is equipped with first aid and resuscitation equipment. All police personnel are trained in first aid.

Response time to a call for assistance is never over two minutes according to City personnel. The police station is located in City Hall, approximately 2 miles from the proposed site.

Fire Protection - Two fire stations are staffed with four man crews, 24 hours a day, seven days a week, to serve St.

TABLE 5. NPDES Permit

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

* 1. During the period beginning on the effective date of this permit and lasting until December 31, 1979 the Permittee is authorized to discharge from outfall serial number 001.

Such discharges shall be limited and monitored by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS Specify Units			MONITORING REQUIREMENTS	
	Monthly Avg.	Variable Daily Max.	Daily Max	Measurement Frequency	Sample Type
Flow-M^3/Day (MGD)	-	-	-	Continuous	Daily Total Flow
Flow in Minnehaha Creek-M^3/Day (MGD)	-	-	-	Continuous	Daily Total Flow
Oil and Grease	10mg/l	0.5 + B mg/l	15mg/l	Daily	Grab
Phenols	-	0.01 + B mg/l	0.1mg/l	Daily	Grab
Quinone	-	0.04 + B mg/l	0.4mg/l	Daily	Grab
Total Chlorine Residual	-	0.01 + B mg/l	0.2mg/l	Daily	Grab
Zinc	-	0.12 + B mg/l	1.0mg/l	Weekly	Grab
Cadmium	-	0.03 + B mg/l	0.2mg/l	Weekly	Grab
Copper	-	0.01 + B mg/l	0.5mg/l	Weekly	Grab
Nickel	-	0.52 + B mg/l	2.0mg/l	Weekly	Grab
Lead	-	0.03 + B mg/l	1.0mg/l	Weekly	Grab
Ammonia (as N)	-	1.0 + B mg/l	2.0mg/l	Weekly	Grab
Benzo-a-pyrene	-	-	0.01 µg/l	Monthly	Grab
Chrysene	-	-	0.01 µg/l	Monthly	Grab
BOD_5	-	-	-	Weekly	Grab
Total Suspended Solids	-	-	-	Weekly	Grab
Turbidity	-	-	-	Weekly	Grab
Fecal Coliform	-	-	-	Weekly	Grab

5003290

The pH shall not be less than 6.5 nor greater than 8.5 and shall be monitored by daily grab sample. These upper and lower limitations are not subject to averaging and shall be met at all times.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

The discharge shall not contain oil or other substances in amounts sufficient to create a visible color film on the surface of the receiving waters.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: at a point representative of the discharge to the Minnehaha Creek.

*See Other Requirements Part I, B. 6. for computation of B value for the specified parameters. The Variable Daily Maximum shall be applicable as the maximum permissable effluent concentration except when the Daily Maximum value is more stringent.
In the event that adequate background monitoring is not done to determine a value for B as defined in Part I B. 6. of this permit then the B value shall be considered equal to zero.

Louis Park. The proposed site lies nearly equidistant from the stations (1 mile plus).

The fire department has six vehicles, with a maximum 85 foot ladder height and a total pumping capacity of 5,250 gpm.

The Department is augmented by a relatively small volunteer staff and the fire departments of neighboring communities.

Health Care Facilities - The four hundred plus bed Methodist Hospital is located in St. Louis Park and, with the completion of Louisiana Avenue, will be about 1/2 mile driving distance from the proposed site. The City is also the location for five nursing homes. It should be noted that, in reality, the residents of St. Louis Park are able to take advantage of the many and varied health care services and facilities located throughout the Metropolitan area.

Recreation Facilities - In addition to the park land to be dedicated on the proposed site itself, three outdoor active and passive recreation areas lie within very close proximity:

- Oak Hill Park, a 24.6 acre multi-purpose facility will be directly linked to the site via bike and pedestrian ways.
- Walker Field, a 3.68 acre athletic field, is also adjacent to the site, at its southwestern corner.
- Freedom Park, a playground of 22 acres, is three blocks west.

Indoor recreation is available through the "lighted schools" program, as well as through the many health and athletic clubs in the Metropolitan area.

SCHOOLS

Total enrollment in the St. Louis Park School District (District #283) is currently 7,974, down nearly 30% from its 1964 peak of 11,200 students. As a result of this decreasing enrollment, three elementary schools have been closed, with one being razed, one is now devoted to community education

and one is vacant. Projected total enrollments for the school district are as follows:

1976-77 - 7,569
1977-78 - 7,027
1978-79 - 6,532
1979-80 - 6,029
1980-81 - 5,650

The proposed development will be served by Park Knoll Elementary School, Central Junior High School and St. Louis Park Senior High School. Some information on these facilities follows:

	Park Knoll	Central J.H.	St. Louis Park H.S.
Structural Condition	Very Good	Old, but good	Very Good
Capacity	550	1,400	2,450
Current Enrollment	501	1,152	2,088

HOUSING

The following table presents an overview of the type, quantity and quality of housing in the City of St. Louis Park. This information has been derived from the City's 1976 Housing Assistance Plan:

	Total	Owner-Type	Rental-Type
Number of Units	17,511	12,069	5,442
% Vacant	2%	1.5%	3.0%
% Substandard	3.8%	2.7%	6.2%
% Rehabilitatable	3.7%	2.6%	6.2%

The plan identified a need for all subsidized housing units, 309 of which should be suitable for elderly or handicapped occupants. Toward meething this need, the City has set as a goal for 1976, the construction or rehabilitation of 340 units (165 elderly). The key to meeting this goal, according to the plan, will be the implementation of the proposed Oak Park Village Development.

In the fourth quarter of 1975, the City of St. Louis Park had a vacancy rate on all types of housing of only 1.6%. The vacancy rate for single family units is 0.6%, while the rate for multi-family dwellings is 4.3%. This low vacancy rate, coupled with the substandard rate of nearly 4%, indicates a need and probable demand for housing in the community.

As stated in the Project Identification section of this document, St. Louis Park is situated in the first ring of western suburbs. Other communities in that sector include Golden Valley and Hopkins. It seems appropriate to consider these communities (St. Louis Park, Hopkins, Golden Valley) as the logical market area for the proposed development. In other words, anyone considering residing in St. Louis Park would also consider Hopkins or Golden Valley. Vacancy rates in Hopkins and Golden Valley are also relatively low, 3.8 and 0.7 respectively, indicating that the demand for the proposed development will likely extend throughout its market area.

Demand in the Metropolitan area for subsidized units was illustrated recently when operators of the South High Housing Development in Minneapolis received more than 1,200 applications for the 212 apartment and townhouse units renting for $83 to $180. The proposed development will provide up to 500 subsidized units.

LAND USE AND ZONING

A general summary of land areas, as zoned, in the City of St. Louis Park is as follows:

- Single family residential area (3,687 acres) accounts for 55% and is 96% developed.
- Multi-family residential area (863 acres) accounts for 12% and is 84% developed.
- Commercial area (345 acres) accounts for 5% and is 80% developed.
- Industrial area (1,934 acres) accounts for 28% and is 53% developed.

The proposed site is currently completely vacant and idle. It was recently rezoned from Industrial to a Planned Unit Development (PUD) zone. This will permit the City to direct future development of the site in accordance with the existing Oak Park Village Site Plan.

Figure 8 presents generalized land use for land surrounding the proposed site. Directly adjacent to the western border of the site is public open space. Single family residential use occurs to the north and northeast. Property east and south of the site is occupied primarily by industrial uses. It should be noted that the City's public library, senior and junior high schools are in rather close proximity to the site's eastern boundary.

Zoning in the areas surrounding the site conforms rather closely to existing land use.

TAX INFORMATION

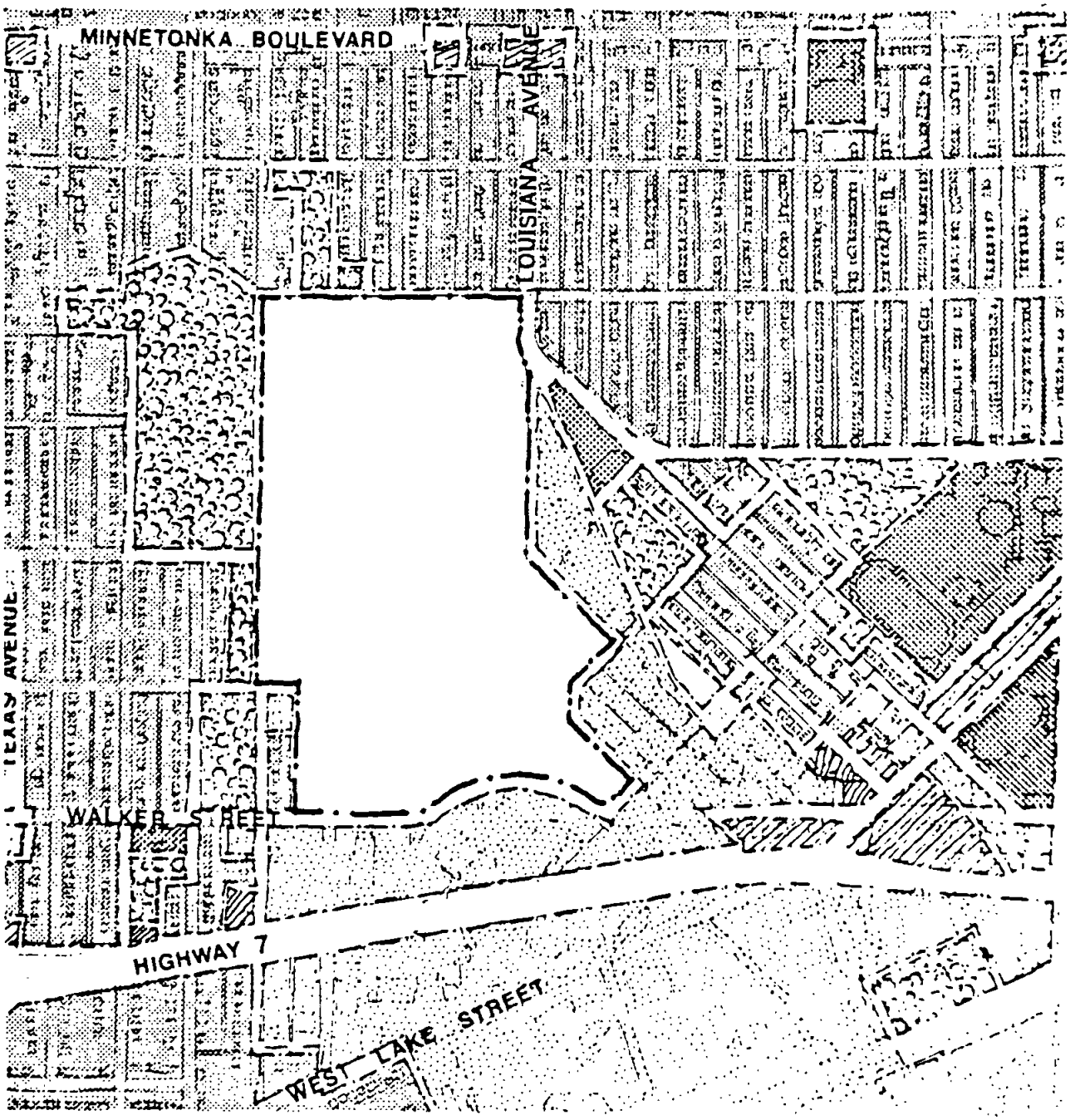
The total market value for all property in the City of St. Louis Park for 1976 has been estimated by the County Assessor to be $579,529,805. The total assessed value is approximately $215,067,241. The City is a net receiver under the Fiscal Disparity Program, as illustrated by its impact on the 1975 Budget:

Taxable Value -

City	
Personal Property	$ 4,158,014
Real Estate	195,228,088
Sub-total	$ 199,386,102
Area-Wide Allocation	
Contribution to pool	$ (1,817,944)
Distribution from pool	2,708,521
Combined Value	$ 200,276,679

Property taxes on land in the City are paid based on the following (1976) mill rates:

5000295-1



single-family residential
multi-family residential
public and institutional
commercial
industrial
parks and open space

generalized land use

0 feet 400 800

N

Source: the HODNEY/STAGEBERG partners

50002955

figure 8

Hennepin County	28.248
School District 283	50.864
City of St. Louis Park	14.920
Special Districts*	3.027
Vocational School	2.759
Minnehaha Watershed District	.115
Total	99.933

PLANNING AND DEVELOPMENT CONTROLS

St. Louis Park employs a planning director with a staff of 2 professionals and up to 5 support personnel. This staff works in conjunction with various city-wide advisory groups; Board of Zoning Appeals, Environmental Improvement Commission, Housing and Redevelopment Authority and the Planning Commission, as well as a number of neighborhood and community groups.

The City maintains the following development control instruments; zoning ordinance, subdivision regulations, housing and building code and a comprehensive plan.

Planning for the proposed development has been undertaken by the Planning Commission, the HRA and various neighborhood groups. Plans have been further refined through consultation with private design firms.

The Metropolitan Council's development policies and guidelines have also served as a planning consideration in the conceptualization of the proposed development. These policies encourage growth (principally residential) in those portions of the Metropolitan area currently served by the basic infrastructural components necessary for modern urban life (i.e. water, sewer, roads, etc.).

*Metropolitan Council, Mosquito Control Commission, Metropolitan Transit Commission, Park Museum.

V. ENVIRONMENTAL IMPACTS

CONSTRUCTION PHASE - PHYSICAL IMPACTS

Site Disruption

The site, as currently constituted, is barren and somewhat lacking in ground cover. General construction activities, includeing excavation and grading, will result in some further disruption of the project site. Inasmuch as development will likely be phased, only certain parcels will be effected at any given time. Soils will be exposed to erosicn from wind and rain. Although any existing ground cover will be eliminated, plans call for the retention of all existing trees. The effects of disruption will be short-term, ceasing to exist once the site is landscaped and reseeded.

According to site plans, the disruption of the site will not include any major alteration of the topography or existing natural amenities. For instance, the tree covered knoll in the south central portion of the site will be retained.

The degree of excavation will be less than might have been expected as no basements will be included. Due to soil conditions and a relatively minor depth to water table, piling will be employed. The number and depth of pilings will be determined on a structure by structure basis. It is expected that timber piling will be used.

Air Quality

Construction activities will impact upon local air quality in two ways; as the result of emissions from internal combustion engines on construction equipment and from fugitive dust generated by construction activities or high winds. The first source, engine emissions, is not expected to result in any noticeable or measurable change in local air quality.

The second source, fugitive dust, will present more of an aesthetic nuisance to workers, passer-by and nearby residences than a real environmental or health hazard. No major on-site burning is foreseen.

Water Quality

Generally speaking, construction activities impact upon water quality by degrading surface runoff through the introduction of oil, grease or other construction related substances and by increasing the level of suspended particulates by exposing soils to erosion. Water quality can also be effected when extensive dewatering is required in the course of excavation. The groundwater removed and exposed to surface pollutants is usually lessened in quality.

Neither of these opportunities for degradation will be present, to any great extent, during the construction of Oak Park Village. Due to limited excavation requirements, dewatering activities should be minor. The degradation of runoff will be minimized as a result of its introduction to the site's storm sewer and treatment system. Particulates will be allowed to settle out of the water in the two holding ponds, while introduced petrochemicals will be treated to varying degrees, by the systems treatment components.

CONSTRUCTION PHASE - CULTURAL IMPACTS

Noise

The amount of noise generated by the construction of Oak Park Village will vary according to the type of site preparation/construction activity undertaken. However, during all construction activities the noise levels will be considerable. The noise levels generated by construction activities on the site can be expected to approximate those indicated in Table 6, assuming a 70 dB(A) ambient noise level at the site which is typical of urban areas.

TABLE 6

TYPICAL RANGE OF NOISE LEVEL AT CONSTRUCTION SITES WITH A 70 dB(A) AMBIENT NOISE LEVEL

Activity	dB(A) Levels I*	II**
Ground Clearing	84	83
Excavation	88	76
Foundations	81	81
Erection	82	71
Finishing	88	74

*All pertinent equipment present at site.
**Minimum required equipment present on site.

Source: U. S. Environmental Protection Agency. Noise From Construction Equipment and Operation, Building Equipment, and Home Appliances, p. 20. Washington, D.C., December 1971.

The impact of construction generated noise will be greatest for those residents that border the site on the north. Those residents along the north side of West 32nd Street will be situated approximately 100 feet from the major noise source when construction occurs in Parcels 1 and 3. The anticipated exterior noise levels at 100 feet from operating equipment is given in Table 7.

Many of the types of construction equipment listed in Table 7 will be used at the Oak Park Village site, and during operation all will produce noise levels in excess of both HUD and MPCA standards for acceptable noise levels. A "normally unacceptable" noise level by HUD standards is one that exceeds 65 dB(A) more than 8 of the 24 daily hours; "a clearly unacceptable" noise level by HUD standards is one that exceeds 80 dB(A) for 60 minutes in 24 hours or 75 dB(A) for 8 hours in a 24 hour period.

TABLE 7

CONSTRUCTION EQUIPMENT/TYPICAL SOUND LEVELS IN dB(A)'s AT 100 FEET DERIVED FROM THE ENVIRONMENTAL PROTECTION AGENCY FIGURES

	dB(A)
Dump Truck	82
Portable Air Compressor	75
Concrete Mixer (truck)	82
Jackhammer	82
Scraper	82
Dozer	81
Paver	81
Generator	70
Rock Drill	92
Pump	70
Pneumatic Tools	79
Backhoe	79
Pile Driver	89

The MPCA noise standards for residential receiving units (Noise Area Classification - 1) are 60 dB(A) which can be exceeded 50 percent (L_{50}) of the time between 7 A.M. and 10 P.M. and 65 dB(A) which can be exceeded only 10 percent (L_{10}) of the time in between these hours.

Given the normal sound attentuation of 60 dB(A) per doubled distance (50 feet, 100 feet, 200 feet, etc.), it is anticipated that when construction occurs in Parcels 1 and 3 the residential units bordering the site on the west and northwest (approximately 100 feet from the construction site) will receive noise levels in excess of both HUD and MPCA standards. Construction on the site will be staged, therefore, it is anticipated that some units will be occupied while construction is occurring in other parcels. Thus, residents in the

occupied units will also receive construction generated noise levels in excess of the HUD and MPCA standards.

Increased Traffic

With the exception of the construction of Parcel 2, all construction related traffic will have access to the site from Louisiana Avenue. The arrival and departure of workers will likely add to the peak period volumes on the roadway, but this addition will not be significant and will not strain the roadway. Deliveries will occur during non-peak periods and should present no traffic problems.

During the construction of Parcel 2, access will be via Pennsylvania Avenue. No problems are anticipated here from traffic volume, but the physical strain on the roadways bearing capacity, as a result of heavy equipment movement, may be disruptive. The current surfacing of Pennsylvania Avenue is temporary, and will be replaced with permanent pavement, curb and gutter upon completion of the proposed project.

Health and Safety

The construction of Oak Park Village will present many of the safety hazards associated with the movement of heavy equipment, the excavation and stockpiling of spoils and construction materials, and general site disruption. These hazards present themselves particularly to two groups of people; construction workers and area children. Any normal, potential threat to workers should be mitigated by strict adherence to OSHA rules and regulations. The hazards to trespassers, and particularly young children, are known as attractive nuisances - spoil piles, trenches, stockpiled materials, idled equipment, partially completed structure. These hazards should be well marked and lit, blockaded or rendered inoperative.

An additional potential health hazard, peculiar to this project, results from the presence of creosote residue in the

soil, in varying concentrations, on portions of the site. With prolonged exposure some of the chemical compounds possibly in the soils have been known carcinogens. This is based on both laboratory testing of animals and on history of the coke and steel industries. Limited exposure may result in inflammation, itching or scaling of the skin or irritation of the eyes, nose and lips. Based on soil borings, this potential hazard will be limited to the low areas in the southern portion of the site. Only those with somewhat sensitive skin might be effected. If gloves are worn and proper personal hygiene employed, chances of even minor irritation are limited. In light of the fact that children would be more susceptible to this hazard, proper precautions should be taken to restrict them from the site prior to completion of revegetation or land farming.

Employment

Inasmuch as developers are yet to be secured for the proposed project, it is impossible to speak with any certainty about construction manpower or methodology. Based on dollar estimates projected for the project, it is possible to grossly estimate the construction related payroll to result from the construction of Oak Park Village.

Projected Market Value	$ 24,215,000
Fair Market Land Value	- 1,109,000
Costs for Site Preparation and Building Construction	$ 23,106,000
Twin Cities Average Manpower Percent of Total Construction Costs	x .43
Construction Related Payroll	$ 9.9

The Twin Cities Metropolitan area is rather well stocked with construction tradesmen and laborers, and will likely supply the necessary manpower. When spread throughout the Metro area and over the duration of development, the $9.9

million in construction payroll will represent a beneficial, but minor, impact upon the area economy.

OPERATIONAL PHASE - PHYSICAL IMPACTS

Increased Flora and Fauna

With the exception of a few portions, the site as currently constituted is somewhat lacking in vegetation. As a result, wildlife, lacking appropriate habitat, is also absent. With development will come landscaping and decorative planting improvements such as sod, shrubs, bushes and trees. This vegetation will then encourage the return of commonly occurring nesting birds and arborial mammals.

Air Quality

In the opinion of the MPCA Air Quality Division, (Edward Wiik, Division Director) the only potential source of significant air quality degradation from the project such as Oak Park Village is auto emissions. The component of greatest concern in such emissions is carbon monoxide (CO). As previously stated, the current (1976) CO count in the site vicinity is .24 ppm. An air quality report,* prepared for the Louisiana Avenue project and considering traffice to be generated by Oak Park Village, employed the California Department of Highways Model in determining that, by 1995, the CO concentrations for an eight hour period in 1995 would be .12 ppm. This reduction will result from more efficient engine operations and more efficient traffic flow.

Water Quality

In terms of direct impact, the proposed development will have favorable effect on surface waters in the area. This will be due to improved and expedited discharge of surface runoff from the site and to treatment of that runoff. The

*Louisiana Avenue and Highway 7, Air Quality Report, St. Louis Park, 1975, Bather, Ringrose, Wolsfeld, Inc.

direct effect on the groundwater should also be beneficial, as the increase in impervious surface resultant from building construction and access way/parking area paving will limit the amount of rain water leaching through possibly contaminated soils and into the water table.

However, there is a remote possibility that the project may indirectly be detrimental to the groundwater by interfering with remedial actions necessary to eliminate impurities from the soil and groundwater. Although the chances of this are limited, they should be considered prior to project implementation.

OPERATIONAL IMPACTS - CULTURAL

Population Growth

As pointed out in the Project Description, the estimated maximum population of Oak Park Village, at full development, will be approximately 2,240. This figure was determined by the St. Louis Park Planning Department, based on the following factors:

200 family units* x 3.2 inhabitants	640
800 conventional units x 2.0 inhabitants =	1,600
total inhabitants =	2,240

Assuming that the City will atain a population of 50,000 to 60,000 residents, the inhabitants of Oak Park Village will represent only 3.7% to 4.5% of the City's population. Further, it cannot be assumed that all, or even most of the 2,240 people will be new residents of the City, and certainly not new residents of the inner-ring western suburbs (Hopkins, Golden Valley and St. Louis Park). The residents of the project are therefore not expected to have a significant impact on the City or the area.

Increased School Enrollments

Based on 1970 census figures, officials of the St. Louis Park School District have determined average number of school

*More than two bedrooms.

age persons (0-20 years) per household by housing type. By multiplying these factors by the total number of units of each housing type, as proposed for Oak Park Village, it is possible to estimate the number of students to be generated by the project at maximum development:

300 Townhouses x .66 (school age population)	= 198
500* Apartments x .16	= 80
Total school age population	= 278

This figure (278) assumes maximum development. Further, it includes both preschool (0-5) and post-school (18-20) age children. It would seem reasonable to assume, then, that the development might generate 200 new students, with roughly 100 of elementary school age and 100 of secondary school age. In light of the School District's decreasing enrollment trend, projected at a rate of over 25% for the next five years, this relatively minor influx of students would not appear to present a problem. There may become a need for some increased busing of elementary school children, but according to School District officials, this would be minor.

Increased Housing

Oak Park Village will add a maximum of 1,000 housing units to the City of St. Louis Park. This would represent an increase of 5.7% over the current (1976) housing inventory in the City. More significant is the fact that one-half of all units built, or potentially 500 units will be set aside for low or moderate income residents. Further, 200 of those subsidized units will be for the elderly. Should a large proportion of the senior citizens residing in the 200 elderly units originate from St. Louis Park, chances are good that a number of single family homes will be vacated, thereby, enhancing further the community's housing market.

As mentioned earlier, development of Oak Park Village is the key to the City's Housing Assistance Plan. Development

*700 total apartments minus 200 apartments designated for the elderly.

at the scale mentioned above will nearly satisfy the City's stated, three year goal of 514 new, assisted units.

Tax Impact

At full development, the proposed Oak Park Village will have an estimated market value, in 1976 dollars of $24,215,000 Applying the various percentage values* as employed by the County Assessor, the estimated assessed value of the project, at full development, will be $6,377,450. Based on the 1975 mill rates applied in St. Louis Park, the project will generate the following annual tax revenues:

Beneficiary	Mill Rate	Revenues
Hennepin County	28.248	$180,150
School District 283	50.864	324,382
St. Louis Park	14.920	95,151
Special Districts	3.027	19,304
Vocational Schools	2.759	17,595
Minnehaha Watershed District	.115	733
Total	99.933	$637,315

The assessed value of Oak Park Village will represent a 2.9 increase in the total assessed value for property in the City. This increase will result primarily from residential development and is therefore not expected to influence the City's Fiscal Disparities role.

It should be noted that all tax revenues generated by this project will be initially devoted to retiring the Development Bonds issued to support the project, under the Tax Increment Financing concept. All bonds will be retired no later than 1995.

Employment Opportunities

Once developed, Oak Park Village will offer rather limited employment opportunities. The main body of the development,

*Commercial - 43%; low-rise residential - 33%; high-rise residential - 25%; subsidized residential - 20%.

the residential/open space portion, will require caretaker-landscaping services, day-care supervision and management*/ maintenance. These activities are not expected to support more than ten full time persons.

Beyond management/maintenance personnel, the operation of the office complex itself is not expected to support any employment.

Indirectly, Oak Park Village may result in an increase in service employment in the local area. St. Louis Park is currently very well served, indicating that any increased employment would be minor.

Increased Demand for Public Services

Discussions with City officials and a review of the size and capabilities of existing service facilities indicate that the proposed Oak Park Village development will not overtax available City services. Water and sewer capacities, both on and off site, will be more than adequate. Due to its location within the Metropolitan area, the development will be generously served by recreation and health care facilities. St. Louis Park itself will offer a great deal in these areas. Solid waste collection will be handled by private contract. The City maintains a list of approximately 25 licensed haulers from which to select.

Discussions with City police and fire chiefs indicate that, based on the current project description, no additional staff or equipment will be immediately required to serve the new development. Both men did indicate that this type of decision cannot be definitely determined until more specific information is available. In the case of Fire Department, factors such as structural type and construction class will be important. The Fire Chief will review all development plans. Police Department changes will be based on

*Management will likely be handled by a private management firm as a portion of their total work load.

the characteristics of future Oak Park Village residents, and the crime incidence in the area.

Increased Traffic

Employing trip generation figures developed by the Illinois Section of the Institute of Traffic Engineers,* the following rough projections have been derived for Oak Park Village.

Access Drive**	Parcels Served	Variable	Trip Factor	Peak Hour Trips
Louisiana & W. 32nd St.	1 & 3	250 units	.69	173
Old & New Louisiana	4 & 1/2 of 5	250 units	.69	173
Louisiana & Walker	1/2 of 5	150 units	.69	104
Pennsylvania Avenue	2	150 units	.69	104
	6	25,000 sq.ft.	2.3/1,000 sq.ft.	58
	7	20,000 sq.ft.	2.3/1,000 sq.ft.	46
			Total	658

The above calculations assume full development, but discount the total number of apartment units by 200 to adjust for the elderly population.

With the exception of Pennsylvania Avenue, all access drives will be served directly by Louisiana Avenue. As previously mentioned, Louisiana Avenue is being upgraded to serve as the City's main north-south corridor. It will have an ADT of 25,000 vehicles. That portion of Louisiana Avenue north of Walker Street is expected to serve a peak hour volume of 1,710. The vehicles generated by Oak Park Village

*"Trip Generation Study for Selected Commercial and Residential Development, Illinois Section, ITE, March, 1970.

**See Figure 2, Page III-7, Site Plan.

during peak period directly to Louisiana Avenue will constitute approximately 39% of the total traffic. Therefore, signalization and lane designation will be of vital importance to insure smooth flow during peak periods. As individual parcels are marketed for development and project implementation becomes more well defined, more intensive traffic planning and engineering will occur.

Pennsylvania Avenue is a 30 foot interior street currently serving a rather limited volume of traffic. With full development of Parcel 2, this street will handle a peak period volume of approximately 104 vehicles, or nearly two vehicles per minute. This does not appear to represent an overload, but may require limited or one sided on-street parking regulations.

Impact of Traffic Noise on Potential Residents

Noise standards have been promulgated by the Minnesota Pollution Control Agency. Although they are not legal requirements, it is the desire of the MPCA that these standards be met. They specify that the upper limit of noise to be received by household units is not to exceed 65 dB(A) more than 10% (L_{10}) of the time between the hours of 7:00 A.M. and 10:00 P.M. During the same period, permissible levels are not to exceed 60 dB(A) 50% (L_{50}) of the time.

Up to 700 residential units will be contained in Parcels 3, 4 and 5, which are immediately adjacent to Louisiana Avenue. Based on a 1973 community noise survey undertaken in St. Louis Park, the noise level on Louisiana Avenue north of Walker St. is 51 dB(A) at L_{10}. With the completion of the improvements of Louisiana Avenue, this noise level is expected to increase as a result of additional traffic volumes.

A projected noise analysis was prepared for the entire route of Louisiana Avenue, based on anticipated maximum traffic volumes. According to the report, L_{10} dB(A) readings

along that portion of the roadway adjacent to the site are as indicated in Table 8.

TABLE 8

ROADWAY NOISE IMPACT - OAK PARK VILLAGE

dB(A) Level	Distance from Western Edge of Louisiana Avenue
80	0-25 Feet
70	25-200 Feet
65	200-300 Feet
<65	350- Feet

As currently designed, all Parcel 3, 4 and 5 structures would be oriented toward the interior of the site, with the nearest structures set back approximately 130 feet from the western edge of Louisiana Avenue. This would place the back portions of the easternmost structures within the 70 dB(A) band. Location and characteristics of window openings will therefore be very important.

Although no structures have yet been designed, it is likely that, based on the interior orientation, rear windows will be limited. Nonetheless, all window openings should be double-glazed, thereby reducing perceived interior noise levels by 30 dB(A), to a most acceptable worst case level of 40 dB(A).

Aesthetic Enhancement

Beyond the measurable environmental shortcomings associated with the Republic Creosote works was the more subjective, yet rather widely held judgement that the plant and storage facilities constituted an "eye sore". This situation has been partially remedied through the elimination of the operation and clearance of the site. As currently constituted, however, the 80 acre site can only be described as barren. The development of Oak Park Village, as conceptualized in the approved site plans, would enhance the landscape tremendously.

Plans call for a highlighting of the few existing natural amenities on site - the pond, the tree covered bluff lines, and the knoll. Additional landscaping would also occur. The groupings of the proposed structures will serve to "break-up" the current, visually barren, nature of the site, while at the same time permitting visual corridors, in all directions, which will provide opportunities for sensory appreciation of an integrated man-made/natural environment. Finally, the development will foster activity - the movement of pedestrians, bicyclists and children at play - to give the site a dynamic of motion.

Compliance with Local/Regional Planning and Policies

The proposed Oak Park Village development does comply with the current zoning classification of the site and the St. Louis Park Comprehensive Plan. In addition, the proposed project will fulfill many of the Housing Policies put forth by the Metropolitan Council in their overall Metropolitan Development Guide. Metropolitan Housing Policies applicable to the proposed project by policy number are:

2. *Local, metropolitan, and federal programs to assist in reducing land cost for developers and low-and-moderate-income housing should be encouraged and existing programs should be expanded.*

The action of the City of St. Louis Park in acquiring the site at its fair market value in 1972 coupled with the land write-down features of the NDP program will result in lower land costs to the developers than if they had to purchase the site and make all improvements at the 1976 cost of land, materials and labor. The saving in lower 1972 land costs should result in lower housing unit costs to the eventual owner/tenant.

5. *Local units of government should adopt land-use regulations that promote the development of a variety of housing types and cost ranges and that allow flexibility in design and site planning, (e.g., PUD ordinances and other ordinances that do not require that excessive amounts of the community be zoned exclusively large lot single-family homes).*

16. *Developments that include both subsidized and regular market rate housing within a single planned residential area are highly encouraged.*

18. *Subsidized housing should be developed so that it will not concentrate lower-income persons and families within a single project or area.*

27. *The Council shall encourage the development of alternative forms of housing such as patio homes, townhouses, quadraminiums, cooperatives, and condominiums to supplement conventional single family homes and apartments.*

29. *Municipalities should undertake actions to expand their low-and-moderate-income housing supply (e.g., establishment of or cooperation with the HRA, approval of subsidized housing proposals, agreements with large-scale developers, code and ordinance reform, stimulate through public planning and developmental activities the creation of planned new residential areas, or develop approaches for locally funded housing programs).*

30. *Large-scale planned unit residential developments should include at least 20 percent of their housing for low-and moderate-income persons.*

The 1,000 unit Oak Park Village project and its integrated diversity of housing unit type and density, of which approximately 50 percent will be subsidized, is an excellent example of the fulfillment of the above policies.

39. *The central cities and older areas of the region should develop or continue programs for the clearance and redevelopment of areas beyond rehabilitation and those devoted to obsolete industrial uses which yield little tax revenue and involve few employment opportunities. In selecting, planning and redeveloping such areas, the following objectives should be pursued:*

    a. *Whenever possible, land should be assembled on a neighborhood scale permitting the development of a new residential environment that includes a full range of services and facilities and high standards of planning and design.*

    b. *A variety of housing types should be developed for persons of a range of income.*

The action of the City of St. Louis Park in purchasing the site and planning the Oak Park Village PUD not only rid the area of an environmentally degrading industrial use that was highly incompatible with the surrounding residential and

public uses, it resulted in the availability of sufficient land to permit the design and economic viability of a project of sufficient size that would make a positive contribution to the housing stock and resource base of the community.

46. *Residential development should occur within or contiguous to the urbanized portion of the region or to free-standing communities, with the possible exception of new towns. Development should be timed to coincide with the economical and orderly provision of such urban level services as central sewer and water facilities, adequate public roads and transportation systems, retail shopping facilities police and fire protection, recreational opportunities, schools, and social services.*

47. *Medium and high density residential development for a full range of incomes should be encouraged convenient to major diversified and industrial centers in the central cities.*

The Oak Park Village Development will utilize existing public utility/service facilities which have sufficient capacity to accommodate project demands. In addition, the project site is located peripherally to community parks, schools and shopping as well as centrally located to existing and future development opportunities in St. Louis Park and surrounding communities.

IMPACTS SUMMARY

The following chart presents a summary of the identified impacts of the Oak Park Village Development, as addressed in this Chapter, and points out the potential effect of each. Chapter VII will review methods for mitigating those impacts identified as negative.

	Positive	Negligible	Negative
Construction Impacts			
Site Disruption			X
Soil Erosion			X
Aesthetic Air Quality Degradation			X
Noise			X
Traffic Increases		X	
Structural Threat to Pennsylvania Avenue			
Health Hazard - Attractive Nuisances			X
Employment/Economic Impact	X		
Operational Impacts			
Increased Flora and Fauna	X		
Air Quality Impacts		X	
Water Quality Impacts - Surface	X		
Water Quality Impacts - Ground	?	?	?
Population Growth		X	
Increased Housing	X		
Tax Impact	X		
Employment Impact		X	
Service Demand		X	
Traffic Increase		X	
Noise Impact on Future Residents of Oak Park Village			X
Aesthetic Impact	X		

VI. ALTERNATIVES TO THE PROPOSED ACTION

There are several alternatives to the proposed 1,000 unit mixed-income Oak Park Village project. They involve no project of any type, a single family housing project, a different design or phasing of the proposed project, and different (non-residential) uses of the site for other projects.

NO PROJECT

In view of the considerable investment that the City of St. Louis Park has in the site (land acquisition, removal of structures, site improvement, loss of property from tax rolls, planning costs, etc.) the City must proceed with a project in order to recover the past and on-going investment. The past action of the City has insured the cessation of additional creosote derived contaminants into the environment and improved the aesthetic quality of the neighborhood, however, the site remains aesthetically negative. No Project would result in a continued loss of future tax revenues to the tax beneficiaries and under utilization of in-place city utilities/services. The continued non-use of the site by the implementation of the No Project alternative would result in an imbalance between community resource and need. It is not a question of whether or not the site will be developed, but rather one of determining the best method of utilizing the resources in a manner consistent with the needs of the community. Therefore, "No Project" cannot be considered a viable alternative.

SINGLE FAMILY RESIDENTIAL DEVELOPMENT

The 57 acre portion of the site which has sufficient bearing capacity to support structures will accommodate approximately 275 single family dwellinga at the current St. Louis Park R-1 zoning requirement of 9,000 square feet of

lot area per dwelling unit. Thus, the use of the site for single family dwelling units would provide only 27.5 percent of the housing as would the proposed use. In view of the low availability of housing in the St. Louis Park area and the small quantity of residentially zoned developable land in St. Louis Park (274 acres) the under utilization of the land and public utility/service resources by the construction of single family units is questionable.

The construction of individual single family dwellings on the site would defeat the desire of the St. Louis Park Housing and Redevelopment Authority to provide adequate low cost housing for its existing and future residents. According to a study prepared by the Real Estate Research Corporation in 1974 for several federal agencies including HUD, the total cost per unit for a single family conventional dwelling was almost 100 percent greater than that for a clustered townhouse unit, as indicated in Table 9. The cost of conventional housing would either be substantially greater than that which the elderly and/or lower income residents could afford or would mean that the amount of subsidized payment would be so large per unit that the number of units that could be subsidized would be sharply decreased.

The changing life-style of Americans in recent years, manifested in part by smaller families and delining population growth (0.8 percent per year in 1975 as compared to 1.62 percent in 1960), has produced a greater demand for smaller more cost-efficient dwellings. The National Housing Center which represents 25,000 homebuilders and 50,000 members in related occupations throughout the country stated that the decreasing size of households has created a large demand for condominiums and townhouses which are less expensive and require less maintenance.*

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*Warren Brown, "Society of Lonely People Feared," Reprint from the Wasington Post, St. Paul Sunday Pioneer Press, March 28, 1976, Family Life Section, pp. 1 and 2.

Table 9
NEIGHBORHOOD COST ANALYSIS
RESIDENTIAL

	Housing Pattern (1,000 Units)					
	A	B	C	D	E	F
	Single-Family Conventional	Single-Family Clustered	Townhouse Clustered	Walk-Up Apartment	High-Rise Apartment	Housing Mix (20 Percent Each A - E)
Capital Costs						
Structure 1/						
Foundation	$ 2,739,000	$ 2,739,000	$ 1,608,000	$ 1,616,040	$ 1,844,262	$ 2,109,260
Shell	20,373,000	20,373,000	8,843,200	4,789,200	6,995,434	12,274,767
Plumbing	3,207,000	3,207,000	2,440,000	2,440,000	2,440,000	2,746,800
Heating	1,444,000	1,444,000	1,044,000	1,049,220	1,304,478	1,257,140
Electric lighting	1,527,000	1,527,000	984,000	988,920	1,229,508	1,251,286
Air conditioning	432,000	432,000	292,800	296,460	914,634	473,573
Subtotal	$29,722,000	$29,722,000	$15,212,000	$11,179,840	$14,728,316	$20,112,831
Paving, parking 1/	584,000	449,000	194,000	266,291	261,219	350,902
Landscaping 2/	255,000	145,000	61,400	43,600	15,350	104,070
Utility connectors 2/						
Sanitary sewerage	332,085	280,995	158,457	24,981	8,367	160,977
Storm drainage	273,702	262,652	60,223	32,575	9,393	127,709
Water supply	460,850	403,000	283,868	47,922	12,159	241,561
Gas	199,895	179,862	120,770	77,734	71,724	129,997
Electricity 3/	197,990	179,530	125,073	85,421	79,862	133,579
Telephone	119,990	101,530	47,073	7,420	1,862	55,579
Subtotal	$ 1,584,512	$ 1,407,569	$ 795,464	$ 276,053	$ 183,407	$ 849,402
Total Capital Costs	$32,145,512	$31,723,569	$16,262,864	$11,765,784	$15,188,292	$21,417,205
Per Unit Cost	$ 32,146	$ 31,724	$ 16,263	$ 11,766	$ 15,188	$ 21,417
Operating and Maintenance Costs						
Per Year	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.

Notes:

N.E. = Not estimated.

1/ Source: Derived from Boeckh Building Valuation Manual (ref. no. 01-005) and Marshall Valuation Service (ref. no. 01-072).

2/ Source: Means Building Construction Cost Data (ref. no. 09-013). Includes 30% for profit, overhead, and engineering fees for utility connectors.

3/ Assumes cost of electric meter = $60 per unit for all housing types.

Source: Real Estate Research Corporation: The Cost of Sprawl, April 1974, Pg. 53.

INDUSTRIAL DEVELOPMENT

Currently there are 1,934 acres of land zoned for industry in St. Louis Park, of which only 53 percent is developed. In all likelihood, the 909 acres of undeveloped industrially zoned land is more than sufficient to accommodate future industrial siting needs within the community. Therefore, the development of the proposed 80-acre Oak Park Village site for industry would be unwarranted. In addition, while there are many types of industrial development, the City has already expended a considerable amount of time and money removing one type of industry from the site and does not desire to replace it with another type of industrial development as it would undoubtedly conflict with the residential and public (parks, school and library) land uses peripheral to the site.

COMMERCIAL DEVELOPMENT

The development of the site for commercial purposes could enhance the tax base of the community. However, the City presently has approximately 70 acres of commercially designated land available for development which should be sufficient to accommodate the needs of the forecasted population.

Currently, there are four community shopping centers within St. Louis Park totaling more than 290,000 square feet, plus a 340,000 square foot district shopping center. In addition, there are two major regional shopping centers (2.2 million square feet total) situated in the neighboring communities of Minnetonka and Edina. The above data suggests that there may be little market potential for the development of another major commercial center on the proposed site.

ALTERNATIVE IMPACTS

It is doubtful if any of the adverse impacts associated with the proposed project would be minimized by the implementation of one or more of the alternatives discussed above.

Obviously, the "No Project" alternative would not generate traffic, however, this positive feature must be weighed against the need for housing as well as the recovery of past financial investments in the site. If the site is completely developed for either commercial or industrial uses, the incompatibility of these two land uses with the abutting residential and public uses must also be considered. Further, the expressed need within the community for economic housing for a diverse section of the population will not be met if the site is developed for either industrial or commercial purposes. In regard to the latter, the same may be said of the use of the site for single family homes.

VII. MITIGATION OF UNAVOIDABLE ADVERSE IMPACTS

CONSTRUCTION IMPACTS

Site Disruption

It is inevitable that the preparation of an area for construction will result in the disruption of that area. The key factor becomes the length of time that the area remains in a disrupted state. Therefore, mitigation is applied in terms of expeditious completion of construction, so that the area may be returned to a more harmonious state.

Soil Erosion

Erosion will occur as a result of the removal of ground cover caused by the movement of heavy equipment and by grading and excavation operations. Both exposed surfaces and spoil piles may be eroded by either strong winds or rain. Both forms of erosion may be mitigated:

Wind - By covering spoil piles with hay or cloth and by sprinkling exposed dusty surfaces, wind erosion can be limited.

Runoff - Erosion via runoff can be controlled through the use of settling ponds to allow suspended particulates to settle out of the water. Covering of spoil piles is also helpful.

Soil erosion is kept at a minimum by prompt paving or revegetation upon completion of construction.

Air Quality Degradation

The quality of the air can be effected by two sources during construction; airborne dust and equipment engines. The minimization of wind erosion will control the dust problem, while maintaining all engines in proper working order will tend to control emissions.

Noise Impacts on Existing Residences

Noise impacts from construction will be highest during excavation and foundation setting (pile driving) and during finishing operations. All work should be conducted during regular working hours and completed in noise sensitive areas as expeditiously as possible. If deemed necessary, a temporary noise barrier may be erected.

Structural Threat to Pennsylvania Avenue

The movement of large trucks and heavy equipment over Pennsylvania Avenue will likely overtax the roadway's bearing capacity. If an alternative route cannot be found, equipment may be moved overland, across the site from Louisiana Avenue. In any event, Pennsylvania Avenue will be reconstructed upon completion of site development.

Attractive Nuisances

All trenches, spoil piles, stockpiles and partially completed structures should be blockaded, secured and well lit. Idle equipment should be rendered inoperative. All OSHA Standards should be strictly adhered to.

Skin Irritation

Gloves and sufficient clothing should be worn when working with contaminated soils. Exposure should not be unduly extended. Proper personal hygiene standards should be observed. Children should be prevented from playing in the construction area.

OPERATIONAL IMPACTS

Roadway Noise Impacts on Development Residents

Residential structures should be oriented toward the interior of the site, away from Louisiana Avenut. Structure setbacks should be as great as possible to allow maximum noise attentuation. The number of windows facing Louisiana Avenue

should be limited and all windows double-glazed to minimize interior traffic noise receptivity.

Traffic generated noise at the exterior of the residential units can be effectively reduced by constructing patio walls, constructing berms peripheral to Louisiana Avenue, or high plantings peripheral to the patios or the roadway. Either berms or walls would be the most effective. The effectiveness of walls or berms in attentuating noise levels increases with height of the barrier and its proximity to the source or receiver. The construction of a berm or wall would effectively reduce yard noise levels to approximately 50 decibels during peak traffic periods. This noise level is considerably less than the normal speaking level of 60 dB(A).

Impact on Groundwater

The City of St. Louis Park is currently working with the Minnesota Pollution Control Agency and the State Department of Health to determine, first, if there is any potential threat to groundwater in or near the site and, if so, how that threat can be eliminated. This process is dependent on information that will not become available until August, 1976. The City will take those actions deemed necessary to resolve any identified problems in this area.

VIII. RELATIONSHIP BETWEEN THE LOCAL SHORT-TERM AND LONG-TERM USES OF THE ENVIRONMENT AND THE COMMITMENT OF RESOURCES

The development of Oak Park Village will provide a greater choice of housing type and price range to the residents of St. Louis Park and the overall Metropolitan area. The construction of the approximately 1,000 dwelling units will represent a long-term benefit to the future owner/tenants. The project will provide housing for those desirous of living in an urban settling in modern structures at an affordable cost regardless of their income. It will permit the use of excess capacity in existing infrastructure components, thereby assurint the payment of previous commitments of capital and the utilization of public resources.

The development of 1,000 dwelling units on the proposed 80 acre Oak Park Village site will represent a savings of an additional 126 acres of land that would be required to provide an equal number of one family detached housing units. Other long-term benefits accruable to the community and the owner/tenants will be the reduced cost of providing utility/ services to the units as indicated in Table 9. An additional long-term benefit of the project is the clustering of people close to an area exhibiting substantial employment opportunities, institutional and recreational amenities, and public transit service.

The development of Oak Park Village will undoubtedly foreclose future options as to the utilization of the 80 acre site for other purposes for a considerable period of time. However, it will permit other developable land presently zoned residential to be used for other purposes. An additional potential foreclosure of future options does exist relative to the State-of-the Art of soil/groundwater creosote pollution detection. If at some future date (10-20-30 years) more sophisticated pollution analysis techniques are developed indicating a long-term creosote pollution problem that can only be

mitigated by radical surface treatment, it could result in an economic hardship for all concerned. Such a possibility is considered highly unlikely.

The development of Oak Park Village will not irreversibly or irretrievably intrude upon any areas of known historic, archeologic or paleontologic significance as indicated in Appendix A, but it will require the irretrievable commitment of resources in the form of man-hours, construction materials, energy consumed by the operation of construction equipment and considerable public and private capital. In a world of increasingly limited resources, this investment can only be justified on the basis of a compensation in benefits to society. Inasmuch as housing is one of man's elementary needs, and considering that Oak Park Village will offer housing to all economic strata, this project would appear to justifiy the expenditure of such resources.

IX. RECOMMENDATIONS

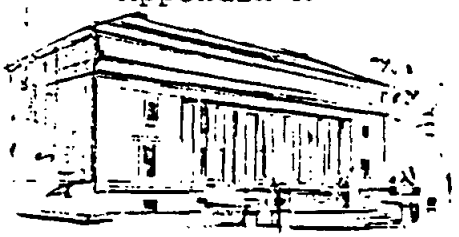
Two important questions must be answered by an environmental assessment; is the projected under consideration of more than local significance, and does the project have the potential for significant environmental effects? Based on information reviewed, it is felt that, in the case of Oak Park Village, the finding is negative in both considerations.

Although housing provided by Oak Park Village will be open to anyone, settlement patterns would seem to indicate that only those with an interest in the St. Louis Park area (western-inner ring) would choose to live there. Impacts of the project will be felt only in its immediate environs. It is, therefore, felt that Oak Park Village does not represent an action of more than local significance.

A potentially serious problem exists concerning chemical contaminants in the soil of portions of the site and areas to the south of the site. Studies are currently underway to determine the probability of those chemical compounds being introduced into the groundwater and, hence, the area's drinking water supply. This situation, undoubtedly, has the potential for significant environmental effects. These effects, however, would not be the result of the proposed project.

The City of St. Louis Park and the HRA will time development of the site to facilitate any curative actions prescribed by MPCA or the Department of Health in dealing with this problem. All efforts will be made by the City to eliminate any threats to their drinking water. It is not felt, however, that the preparation of an Environmental Impact Statement on Oak Park Village would aid in that effort. Therefore, in determining that the development of Oak Park Village does not present the potential for significant environmental effects, it is recommended that no Environmental Impact Statement be required or prepared for the Minnesota Environmental Quality Council.

Appendix A



MINNESOTA HISTORICAL SOCIETY

690 Cedar Street, St. Paul, Minnesota 55101 • 612-296-2747

April 7, 1976

Mr. Jeffrey F. Squires
National Biocentric, Inc.
2233 Hamline Avenue North
St. Paul, Minnesota 55113

Dear Mr. Squires:

RE: National Biocentric, Inc. City of St. Louis Park; Renewal of 80 acre site, residential/commercial development. Hennepin County

The project described above has been reviewed pursuant to responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the National Advisory Council on Historic Preservation (36CFR800).

This review reveals the location of no sites of historic, architectural, cultural, or archaeological significance within the area of the proposed project. There are no sites in the area which are on the National Register or eligible for inclusion on the National Register, and, therefore, none which may be affected by your proposal.

Sincerely,

Russell W. Fridley
State Historic Preservation Officer

RWF/fr

5000298

Appendix B

COORDINATION LIST

David Rudberg	City of St. Louis Park
William Thibault	City of St. Louis Park
Harvey McPhee	City of St. Louis Park
Police Chief Setter	City of St. Louis Park
Fire Chief McGary	City of St. Louis Park
Jeffrey Johnson	Orr-Schelen-Mayeron & Assoc.
Lawrence Kelley	Minnehaha Creek Watershed District
John Holmquist	Minnehaha Creek Watershed District
Edward Ross	State Health Department
Dale Wikre	Minnesota Pollution Control Agency
Edward Wiik	Minnesota Pollution Control Agency
Irving Bergsagle	School District #283
Dr. Michael Holmes	School District #283
Alan Gebhard	Barr Engineering
Dr. G. E. Ham	University of Minnesota Soil Science

Appendix C

STATEMENT ON ENERGY

Due to the very preliminary nature of the development process, in terms of implementation of the Oak Park Village project, it is not possible to be specific at this time in addressing the concerns of the Minnesota Energy Agency. A few relevant facts can be pointed out:

1. Project developers will be required to comply with the State building code in terms of energy conservation through the use of selected construction materials and techniques.
2. Energy will be provided via conventional utility delivery systems (pipe, cable, etc.) and no storage or stockpiling of fuels on site will be required.
3. Energy will be provided on a firm basis by major suppliers (NSP, Minnegasco, etc.).
4. Other than that amount devoted to transportation of project occupants or employees, no secondary energy uses are foreseen.
5. In terms of per household consumption of energy, the selection of apartment and attached townhouse units should prove superior to single family development. Although initially motivated by density and financial feasibility requirements, the energy efficiency derived from the proposed housing mix must be viewed as a plus.
6. The project's relatively close proximity to the Minneapolis CBD (5 miles) will reduce energy consumption that would otherwise result from residential development in the outer portions of the Metropolitan area. In this regard, the project also reflects Metropolitan Council Development Guidelines.

RECOMMENDATIONS

	Barr	PCA	Health Department
Existing Wells	1. Grout and abandon uncased bedrock wells providing interchange of contaminated water between aquifers 2. Abandon City Wells No. 1, 2 and 3	1. Grout and abandon uncased bedrock wells providing interchange of contaminated water between aquifers 2. Abandon City Wells No. 1, 2 and 3	1. Grout and abandon uncased bedrock wells providing interchange of contaminated water between aquifers 2. Abandon City Wells No. 1, 2 and 3 3. Study Robinson Rubber Company well to determine which aquifer is its source of contamination; then grout and abandon.
Gradient Control Wells	1. Construct three gradient control wells in glacial drift groundwater system	1. Construct barrier well system in glacial drift groundwater system 2. Additional corrective measures may be required	1. Construct barrier well system capable of removing and halting the spread of contaminated water in the drift and platteville aquifers and any deeper aquifer determined to be contaminated.
Discharge/Treatment	1. Discharge water into sanitary sewers 2. Conduct studies to determine treatability of groundwater for discharge into Minnehaha Creek 3. After appropriate treatment, possible discharge into Minnehaha Creek	1. Pretreatment of groundwater for removal of PAH compounds prior to discharge into sanitary sewers 2. Treatment of groundwater for discharge into Minnehaha Creek 3. Limited initial untreated discharges into sanitary sewer system to collect data for treatment plant design.	1. Extensive treatment of ground water at well site. 2. Discharge of treated groundwater into sanitary sewer system.

	Barr	PCA	Health Department
Geologic and Hydrologic Studies	1. Define hydrogeology of bedrock valley located near Highway 100 and Excelsior Boulevard; define its extent and estimate gradients and likely vertical flow rates	1. Determine extent of contamination of the St. Peter in the immediate vicinity of the Robinson Rubber Company well. 2. Define possible buried valley south of the site and buried valley east of the site 3. Further study of abandonment of all City well No. 1 including high rate pumping and sampling.	1. Establish assumed presence of the glenwood shale in the erosional channel immediately south of site. 2. Determine the piegometric head gradients, the porosity and the amount of solution channeling and the direction and rate of flow in the platteville for all seasons and a variety of local pumping conditions. 3. Further study of old city well no. 1 4. Determine the bedrock valley to the east of the site. 5. Conduct solubility studies for coal-tar wastes. 6. Determine source of high concentration of phenols in Robinson Rubber Company well
Monitoring	1. Monitor gradient control system in terms of: a. ability to capture contamination of discharge into Minnehaha Creek b. Ability of treatment facility to meet effluent limitations 2. Monitor quality of water in St. Peter aquifer through placement of two additional wells.	1. Monitor gradient control system 2. Monitor quality of water in the St. Peter 3. Monitor the St. Peter in the vicinity of the buried valleys	1. Monitor all SLP and Edina municipal wells, plus other, yet to be determined, downstream monitoring wells for trace PAH contamination, quarterly for one year.

	Barr	PCA	Health Department
Monitoring (continued)	3. Place monitoring wells at the western and northern edge of the bedrock valley to define quality of water		
Other			1. Conduct ambient air studies to determine existing human exposures to PAH compounds 2. Halt construction activity which will interfere with future corrective measures 3. Excavation of contaminated soil should occur if contamination cannot be completely controlled by the barrier well system or ambient air studies show the contaminated soils are resulting in excessive human exposure to PAH compounds. 4. Epidemiology Studies

Bill Thibault

supplemental information environmental assessment oak park village

Submitted to:

Minnesota Environmental Quality Council
Capitol Square Building
St. Paul, Minnesota

Submitted by:

City of St. Louis Park
5005 Minnetonka Boulevard
St. Louis Park, Minnesota

June 23, 1976

50002392

TABLE OF CONTENTS

APPENDIX

INTRODUCTION

The City of St. Louis Park submitted to the Minnesota Environmental Quality Council (MEQC) an environmental assessment dated April 16, 1976, on the proposed Oak Park Village development consisting of 1,000 residential units on approximately 80 acres of property in the City of St. Louis Park. This property is the former site of Reilly Tar and Chemical Company. The original development called for five residential parcels, two commercial parcels and 23 acres of open space. The site has been cleared, graded and improved with storm sewer.

Since the submittal of the Environmental Assessment to the MEQC, the Soil and Groundwater Investigation (Phase I) prepared by Barr Engineering Company has been completed and, at the request of the MEQC, has been made a part of the City's Environmental Assessment. As a result of review of the Barr Phase I Study and further environmental review and investigation of the project, the City now proposes to develop only Parcels 1, 3 and 4 — roughly the northern half of the site. No development on the south half of the site is proposed. The St. Louis Park City Council, the City Planning Commission and the St. Louis Park Housing and Redevelopment Authority have reviewed and authorized amendments to the City's Urban Renewal Plan to accomplish this change.

The issue before the MEQC is whether the development of a maximum of 470 residential units on Parcels 1, 3 and 4 is a "major governmental action" with "potential for significant environmental effects."

The following report contains a description of events which led to the City's original development proposal for Oak Park Village, a review of the environmental analysis of that proposal and a description of the revised plan resulting from the environmental analysis. Finally, the legal and environmental ramifications of the revised plan are discussed.

BACKGROUND

SUMMARY OF CITY ACTION 1961 - 1968

Elimination of Reilly Tar and Chemical Company as a nonconforming noxious use or the cessation and abatement of its pollution represents at least a 15-year effort by the City. During this 15-year period, which commenced in 1961, the City used its planning, renewal and Ordinance powers to abate or eliminate the problem.

Establishment of a Housing and Redevelopment Authority was prevented in 1962, by successful litigation on the part of Reilly Tar and Chemical Company. The company maintained that the purpose for establishing the Authority was to use public powers to eliminate its operation.

In 1967, planning efforts to show public and non-industrial use for the northerly end of the creosote site were approved.

In May, 1969, the City adopted a comprehensive Air Pollution Ordinance — perhaps the first in the state. Shortly thereafter, an Odor Panel was established in connection with determining an air pollution nuisance from Reilly Tar and Chemical site.

SUMMARY OF STATE AND CITY ACTION 1968 - 1972

Between 1968 and 1970, the City worked cooperatively with various state agencies to identify pollution at the site and to study remedial actions available. In 1970, the City and the Minnesota Pollution Control Agency initiated legal action against Reilly Tar and Chemical Company to abate the air pollution. This litigation was settled on between the City and Reilly Tar and Chemical Company as a part of the City's purchase of the entire site in 1972. A summary of the events is contained in a memorandum from Wayne G. Popham, City Attorney, St. Louis Park, to Eldon Kaul, Assistant Attorney General, Minnesota Pollution Control Agency, dated November 27, 1974, attached as Appendix 1.

CITY'S URBAN RENEWAL PLAN

The City established a Housing and Redevelopment Authority in 1970, to address low-income housing needs and consider redevelopment of property as appropriate.

In 1972, the City completed its application for a federal Neighborhood Development Program (NDP) which includes an Urban Renewal Plan and Financial Plan for elimination of blighting influences caused by the Reilly Tar and Chemical Company.

STORM SEWER SYSTEM

BACKGROUND

One of the major problems with the former Republic Creosote operation was surface water pollution. All wastes from the plant were deposited on the surface which accumulated in ponds and for many years flowed to Minnehaha Creek. This problem of surface water pollution was recognized as a factor which required special design treatment for a storm sewer system.

In 1972, the City retained the consulting firm of Orr-Schelen-Mayeron to design the storm sewer system for the area. Working with the staffs of the City, Pollution Control Agency, and Health Department, the consultant developed a storm sewer design which was directed toward minimizing storm water pollution. The design which developed utilized several unique features approved by the P.C.A.

The P.C.A. Board also ruled that the storm sewer discharge from this area was a point source of pollution. As a result, a National Pollutant Discharge Elimination System (NPDES) Permit was required prior to discharge into Minnehaha Creek. The storm sewer design was reviewed and approved by the P.C.A. and a NPDES Permit was issued. (Permit No. 0045489). This permit set forth the design requirements, effluent limitations, and a monitoring program for measuring the storm water discharges. Various chemical and physical parameters were set forth in the permit which could not be exceeded. Parameters such as oil and grease, phenols, quinone, chlorine, heavy metals, benzo-k-pyrene, chrysene, suspended solids, turbidity, etc. are now routinely monitored in order to be in compliance with the permit.

SYSTEM COMPONENTS

The storm sewer system was completed during the spring of 1976. The entire drainage area served is 300 acres with 80 acres in the Oak Park Village site. The site is served by a major trunk line located in the center; lying in a north/south direction. As the various parcels are developed, storm sewer laterals from these parcels would be connected to the trunk line. All of the storm water is discharged into Minnehaha Creek by means of a pump station.

The storm sewer system has several features which minimize the intrusion of pollutants and provides treatment should they be present. These features are summarized as follows:

1. Two large storm sewer holding ponds were constructed to provide for settlement of suspended solids and aeration treatment. One pond is located on the Oak Park Village site and the other is located south of Highway 7. These ponds are completely lined with polyethylene in order to prevent the interchange of groundwater and storm water.

2. A treatment plant was constructed which treats the storm water with sodium hypochlorite and chlorine. These chemicals would oxidize any organic chemicals which might exist. In addition, a dechlorinizer is added prior to discharge into the Creek.

3. All the storm water pipes are specially sealed to prevent the intrusion of groundwater.

4. All of the contaminated soils excavated from the ponds were land farmed in the drainage area. This is a treatment process which breaks down the organic materials through a chemical (fertilizers) and biological (plantings) process.

This storm sewer system was constructed at a cost of $1,800,000 with $800,000 directly attributed to pollution control measures.

Test Results

SERCO Laboratories are now providing testing of the storm water discharges at various points in the system. This is done as part of the monitoring program for the NPDES Permit. All of the tests indicate that the storm water meets all NPDES chemical and physical standards prior to treatment.

Appendix 2 contains:

1) Monitoring stations for storm water
2) NPDES discharge standards (Permit No. 0045489)
3) SERCO Laboratory test results

oak park village

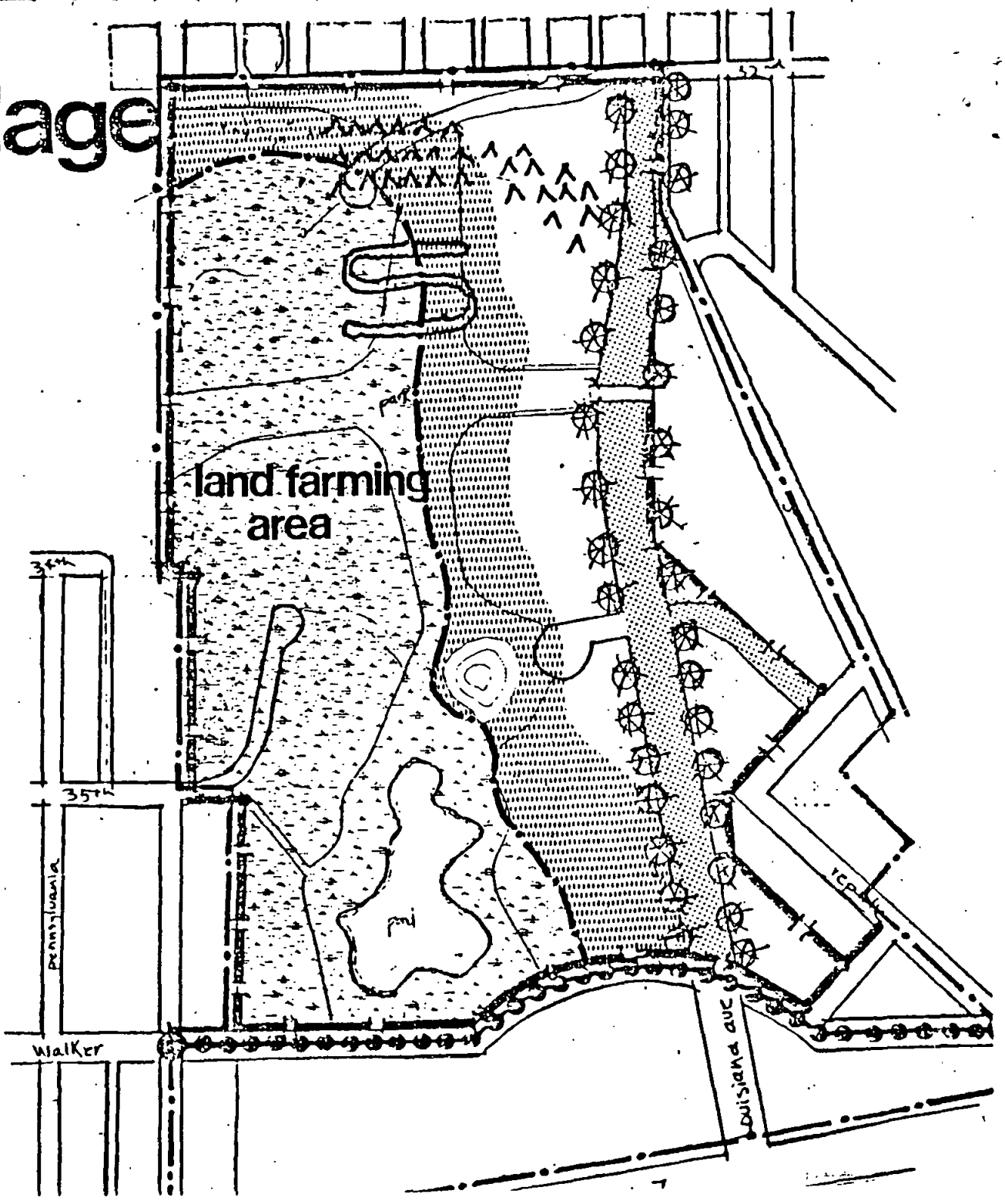
north 1":400'

NDP ACQUISITION BOUNDARY

NDP PROJECT BOUNDARY

non cash credits

- Louisiana Avenue
- Walker Watermain
- Grading
- Land Farming
- Trees
  - 9 American Linden
  - 9 Red Maple
  - 14 Marshall Green Ash
- Temporary Leaf Compost Row
- Temporary Storage of Fill



REILLY SITE STUDY PLANNING MEETING 9/9/91

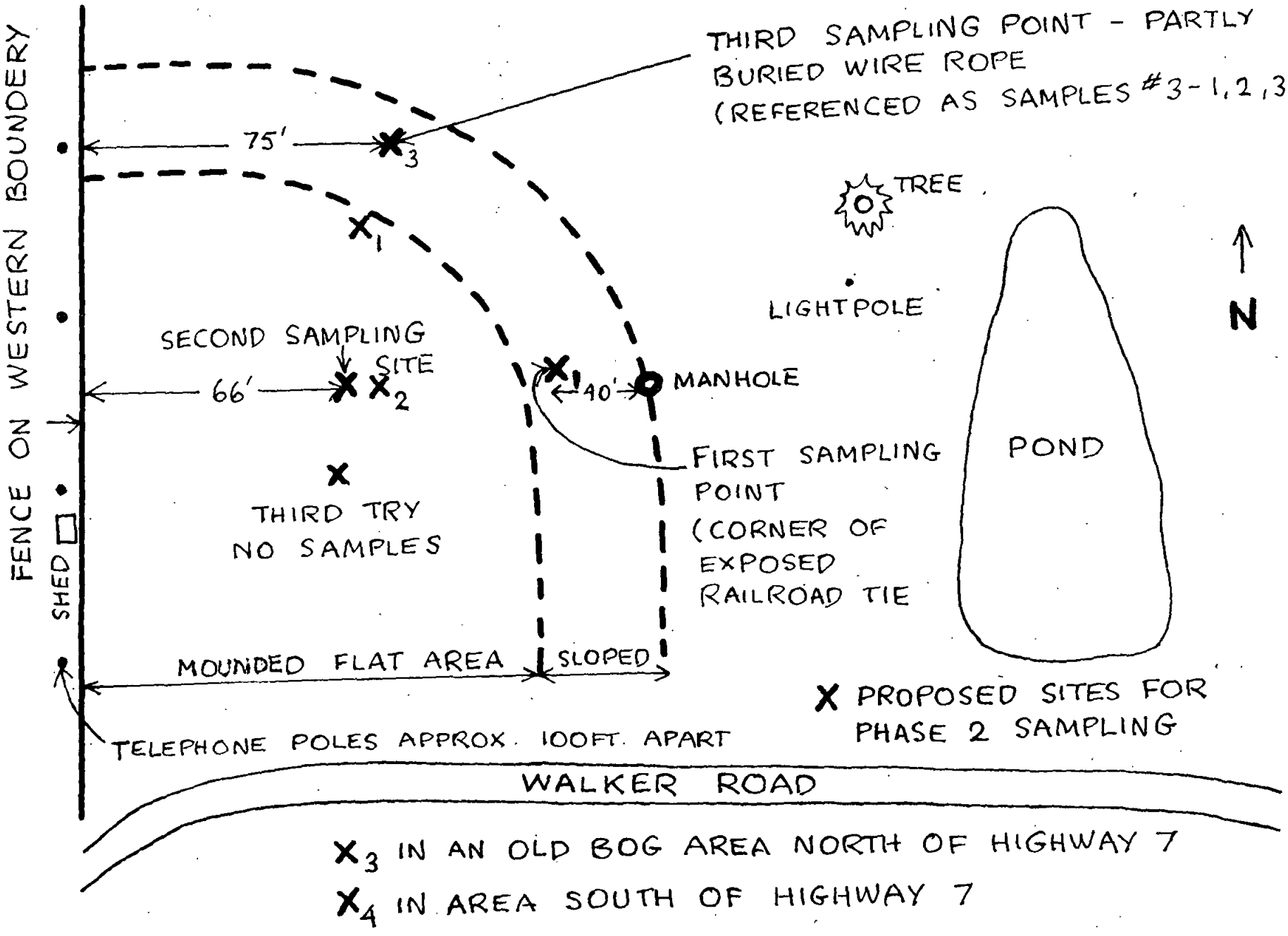
1.Present and discuss findings on chemical composition of near surface samples taken 6/31/91
* Methodologies for extraction and analysis of PAH'S have been calibrated
*Samples show that mounded area contains significant concentrations of creosote related organics
*Study will focus on PAH's

2 Discuss and plan second phase of sampling program, using MPCA rig.
Objectives:
a) Obtain vertical profile samples from several locations on the site.
b) Determine whether thin wall (Shelby) tubes can be used to obtain cores of undisturbed soil.
c Determine moisture content and approximate depth of water table.
d. Analyze soil samples to determine physical properties and chemical content.
This type of data is neede to guide the subsequent drilling operations aimed at obtaining intact cores.
3 Determine specific site locations for driling.
*Mounded area
*Bog area north of highway 7
* Runoff area south of highway 7.

4. Limitations
Maximum number of borings that MPCA can do?
Maximum number of samples to be tested ?

MOUNDED AREA ON REILLY SITE

(NOT TO SCALE)



X_3 IN AN OLD BOG AREA NORTH OF HIGHWAY 7

X_4 IN AREA SOUTH OF HIGHWAY 7

DRAFT

Major PAH Analysis of Soils from 3 Reilly Sites (Corrected Values)

mg/kg

Extraction Method: Quick DCM Extraction
Surrogate: 2-Fluorobiphenyl
GC Analysis:
Column: Hewlett Packard HP-5, 0.2mm i.d., 0.33µm capillary column
Carrier gas: Hydrogen, 2 ml/min.
Makeup gas: Nitrogen, 35 ml/min.
Detector: FID
Injection: 1 µL splitless, autosampler
Program: 40°C, 4 min., 10°C/min., 300°C 20 min.

Site #1:

In.	NAP	ACN	ACE	FLU	PHE	ANT	FLA	PYR	CHR	BAA
20	33.01	5.21	267.18	596.81	1418.53	1698.05	1566.27	1144.36	326.20	364.66
31	30.37	5.09	145.71	231.29	665.16	774.79	610.43	489.82	166.99	155.40
40.5	29.88	5.34	70.86	87.67	209.20	385.09	354.79	295.28	178.10	137.30
48	7.73	2.64	20.06	28.83	97.30	120.12	127.36	116.50	69.26	58.16
57.5	6.56	3.99	53.31	67.73	227.30	214.36	186.32	150.12	91.90	57.05

Site #2:

In.	NAP	ACN	ACE	FLU	PHE	ANT	FLA	PYR	CHR	BAA
30	5.03	3.19	1.96	1.90	13.44	2.70	32.33	33.62	1202.58	7.91

Site #3:

In.	NAP	ACN	ACE	FLU	PHE	ANT	FLA	PYR	CHR	BAA
39	461.90	110.98	3102.65	293.68	4639.96	7174.02	5543.40	4078.18	207.42	1274.36
44	46.75	4.85	180.68	132.58	357.24	388.16	426.44	404.05	74.97	146.63
50	14.11	2.27	32.45	62.64	165.40	263.68	176.44	138.04	242.82	55.77
61	27.36	5.52	176.75	220.61	603.01	410.92	632.95	528.71		226.93

*Concentrations in mg/kg soil

NAP Naphthalene
ACN Acenaphthylene
ACE Acenaphthene
FLU Fluorene
PHE Phenanthrene
ANT Anthracene
FLA Fluoranthene
PYR Pyrene
CHR Chrysene
BAA Benzo(a)anthracene

DRAFT

Major PAH Analysis of Soils from 3 Reilly Sites

Extraction Method: Quick DCM Extraction
Surrogate: 2-Fluorobiphenyl
GC Analysis:
Column: Hewlett Packard HP-5, 0.2mm i.d., 0.33µm capillary column
Carrier gas: Hydrogen, 2 ml/min.
Makeup gas: Nitrogen, 35 ml/min.
Detector: FID
Injection: 1 µL splitless, autosampler
Program: 40°C, 4 min., 10°C/min., 300°C 20 min.

Site #1:

In.	NAP	ACN	ACE	FLU	PHE	ANT	FLA	PYR	CHR	BAA
20	2.69	0.43	21.78	48.64	115.61	138.39	127.65	93.27	26.59	29.72
31	2.48	0.42	11.88	18.85	54.21	63.15	49.75	39.92	13.61	12.67
40.5	2.44	0.44	5.78	7.15	17.05	31.39	28.92	24.07	14.52	11.19
48	0.63	0.22	1.64	2.35	7.93	9.79	10.38	9.50	5.65	4.74
57.5	0.54	0.33	4.35	5.52	18.53	17.52	15.19	12.24	7.49	4.65

Site #2:

In.	NAP	ACN	ACE	FLU	PHE	ANT	FLA	PYR	CHR	BAA
30	0.41	0.26	0.16	0.16	1.10	0.22	2.64	2.74	98.01	0.65

Site #3:

In.	NAP	ACN	ACE	FLU	PHE	ANT	FLA	PYR	CHR	BAA
39	37.65	9.05	252.87	23.94	376.16	584.68	451.79	332.37	16.91	103.86
44	3.81	0.40	14.73	10.81	29.12	31.64	34.76	32.93	6.11	11.95
50	1.15	0.19	2.65	5.11	13.48	21.49	14.38	11.25	19.79	4.55
61	2.23	0.45	14.41	17.98	49.15	33.49	51.59	43.09		18.50

*Concentrations in mg/kg soil

NAP Naphthalene
ACN Acenaphthylene
ACE Acenaphthene
FLU Fluorene
PHE Phenanthrene
ANT Anthracene
FLA Fluoranthene
PYR Pyrene
CHR Chrysene
BAA Benzo(a)anthracene

DRAFT

Comparison of Soxhlet Extraction and Quick DCM Extraction Methods

Site # 1, 57.5 inches below grade:

Extraction	NAP	ACN	ACE	FLU	PHE	ANT	FLA	PYR	CHR	BAA
Soxhlet	6.00	3.90	56.90	76.70	208.00	315.80	185.90	147.10	56.10	33.10
QDCM	0.54	0.33	4.35	5.52	18.53	17.52	15.19	12.24	7.49	4.65
Soxhlet/QDCM	11.11	11.82	13.08	13.89	11.23	18.02	12.24	12.02	7.49	7.12

*Concentrations in mg/kg soil

Soxhlet: Soxhlet Extraction, EPA Method 3540
QDCM: Quick Dichloromethane Extraction

NAP Naphthalene
ACN Acenaphthylene
ACE Acenaphthene
FLU Fluorene
PHE Phenanthrene
ANT Anthracene
FLA Fluoranthene
PYR Pyrene
CHR Chrysene
BAA Benzo(a)anthracene

45223

45224

Site # 3 Depth 57.5 meters

Extraction Soxhlet Extraction

10 gm soil

Final Volume 10 ml

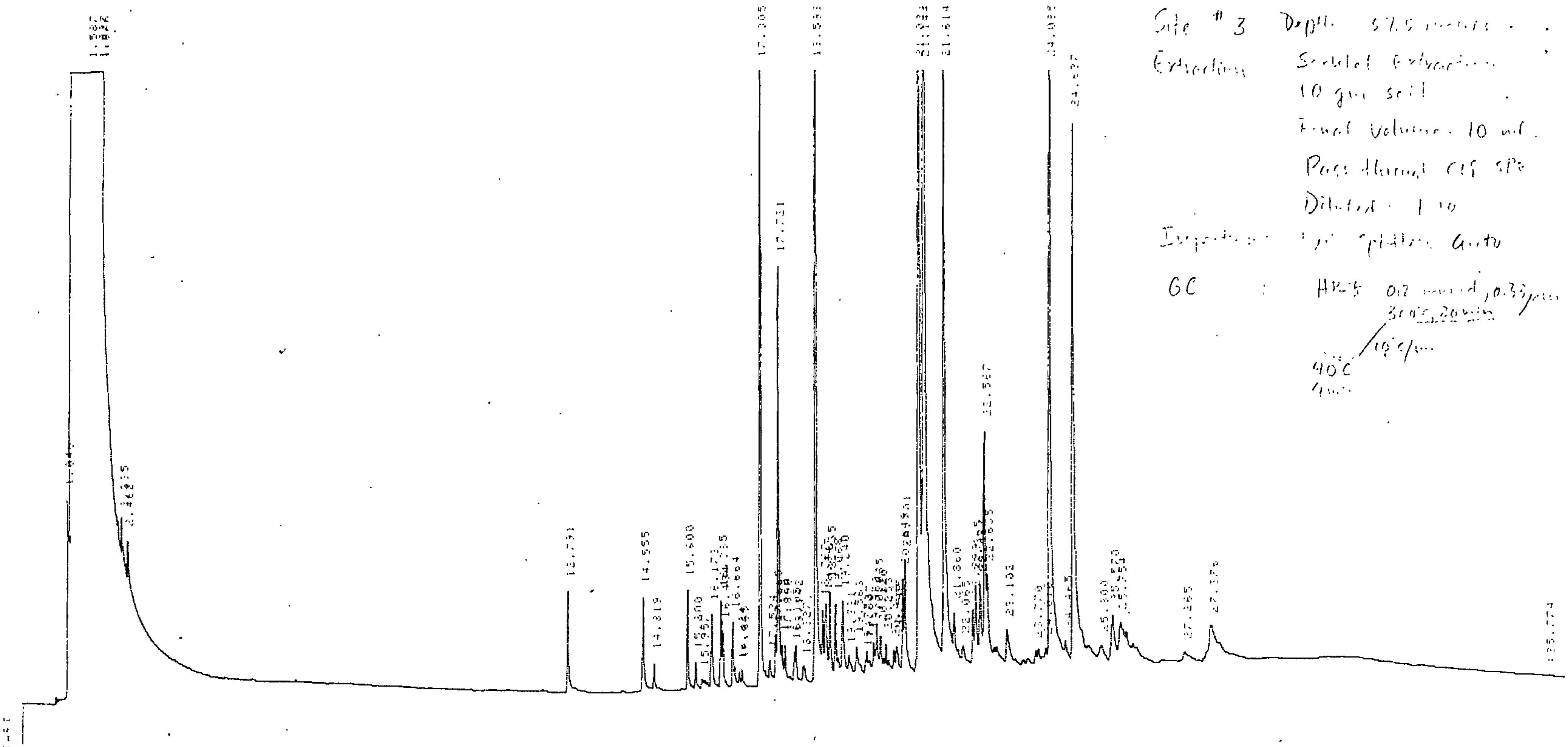
Pass through C18 SPE

Diluted 1:10

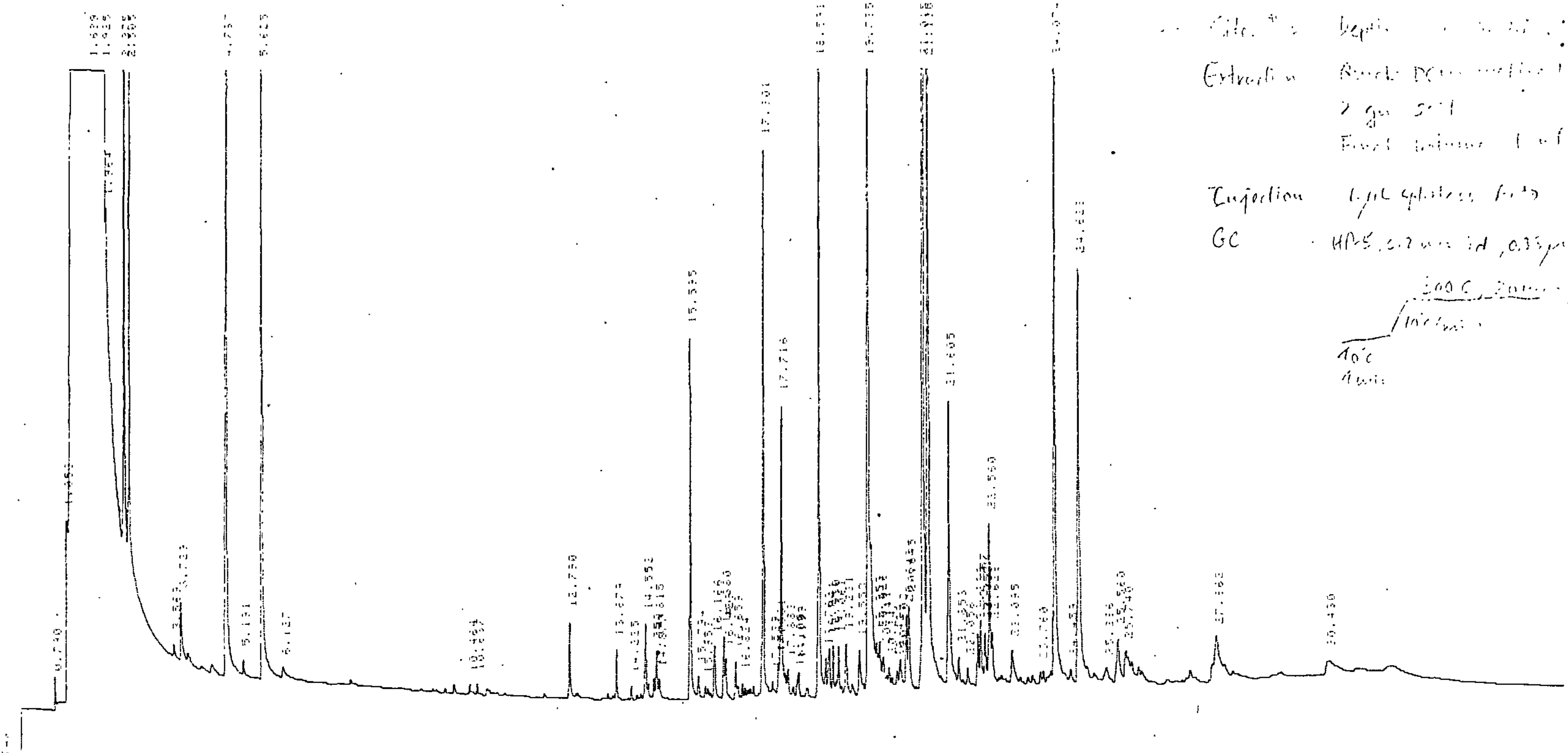
Injection 1 µl Splitless Auto

GC : HP-5 0.2 mm id, 0.33 µm

40°C 4 min / 10°C/min / 300°C 20 min



45011



Extraction

Injection

GC

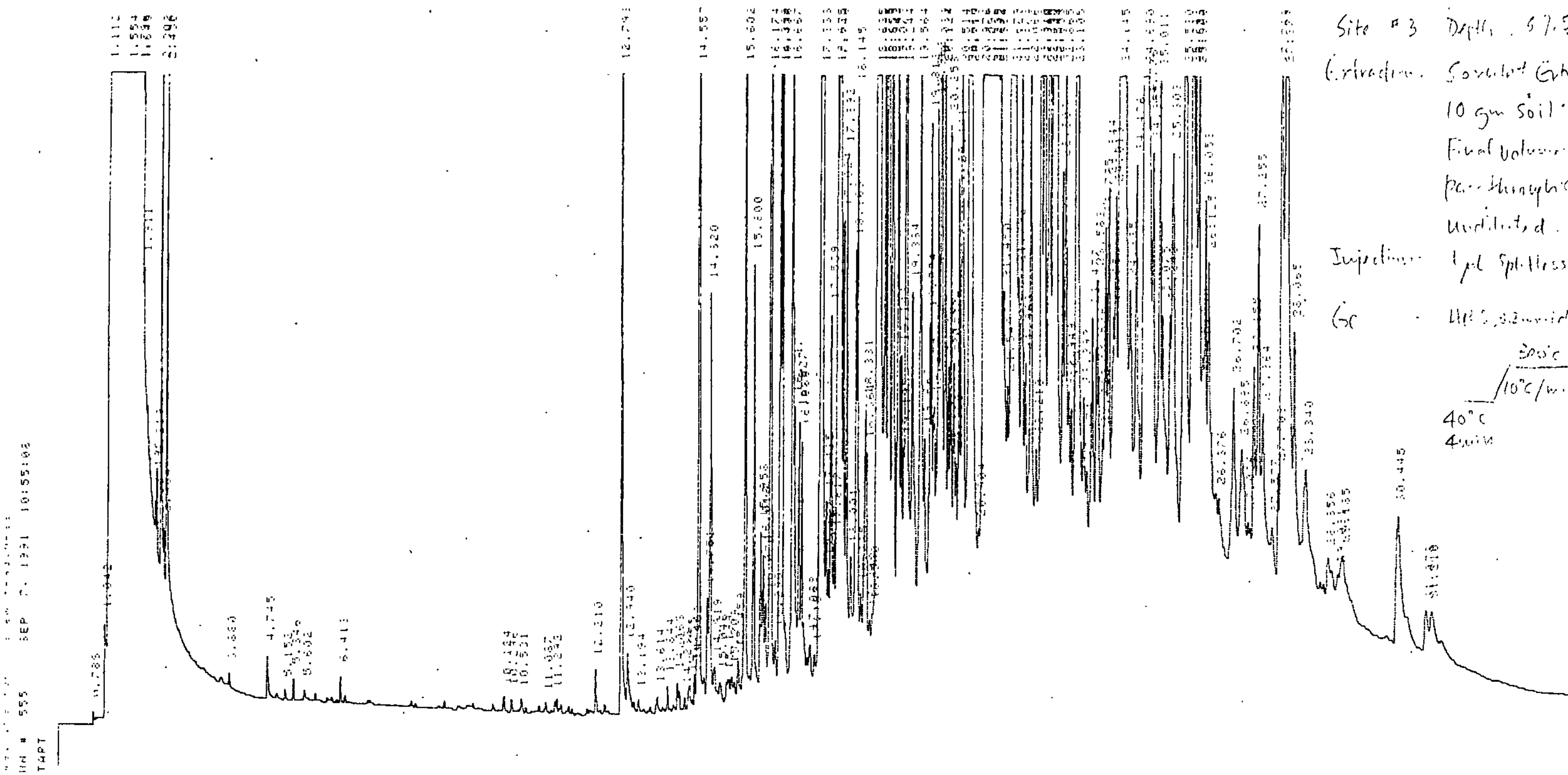
45226

Site # 3 Depth : 57.5 in.

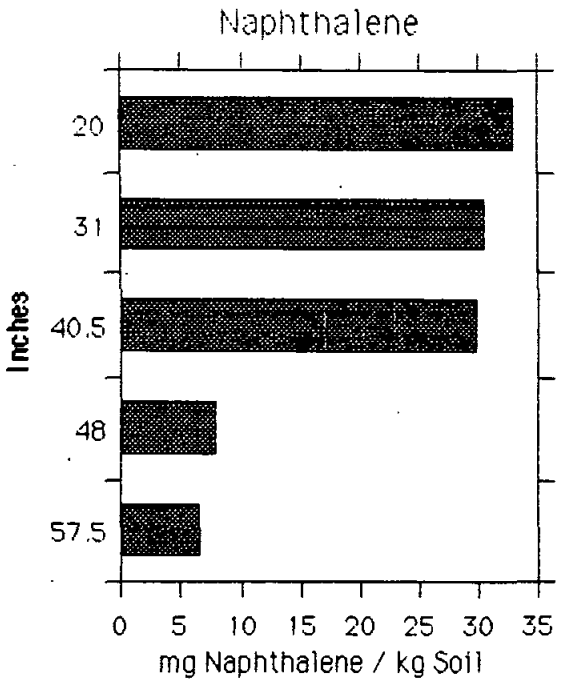
Extraction : Soxhlet Extraction
10 gm Soil
Final Volume 10 ml
Pass through 0.45 µm
Undiluted

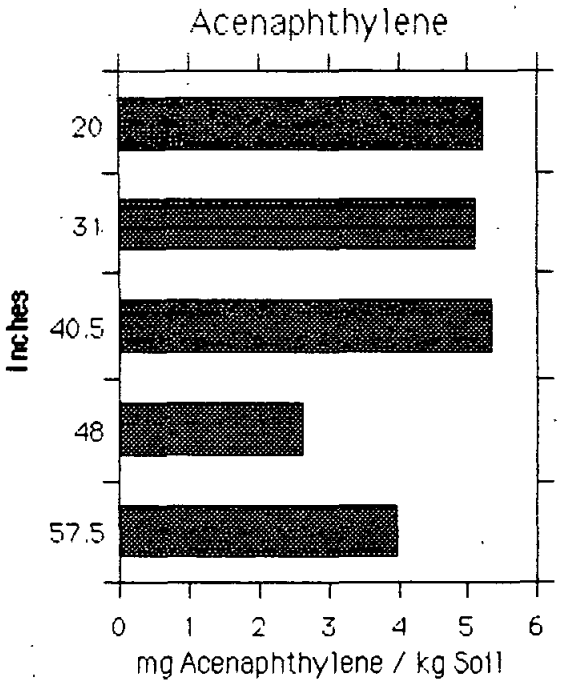
Injection : 1 µl Splitless Auto

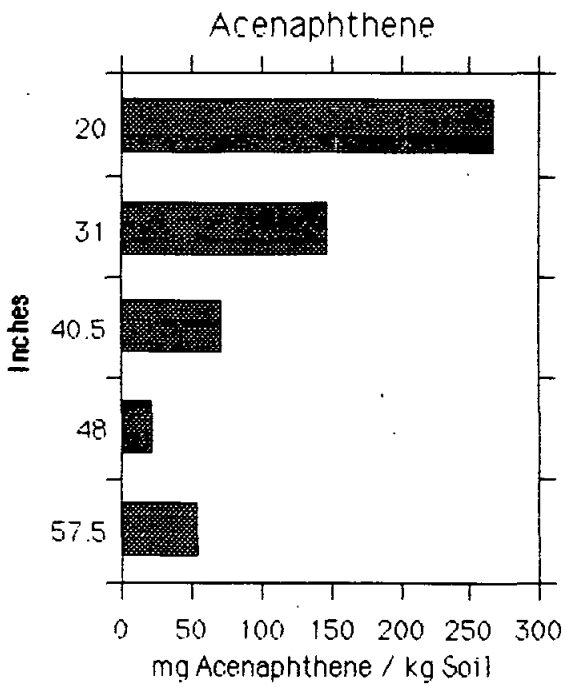
GC : HP 5, 30 m x 0.32 mm id, 0.25 µm
300°C, 20 min
/10°C/min
40°C
4 min

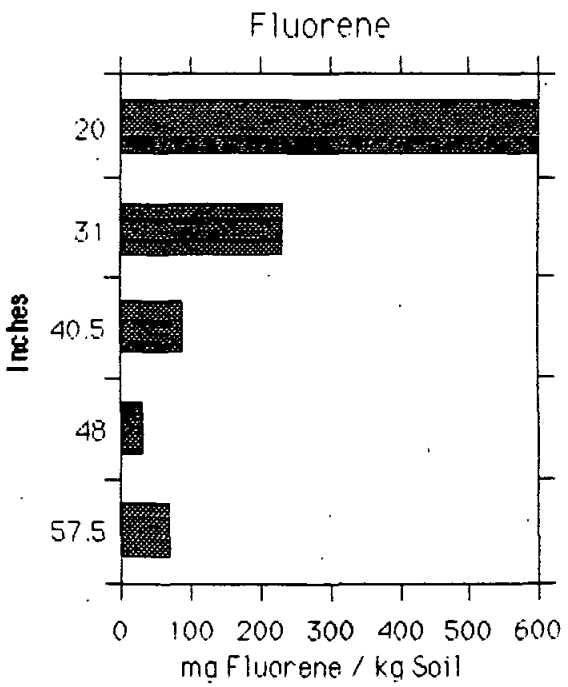


Reilly Site #1

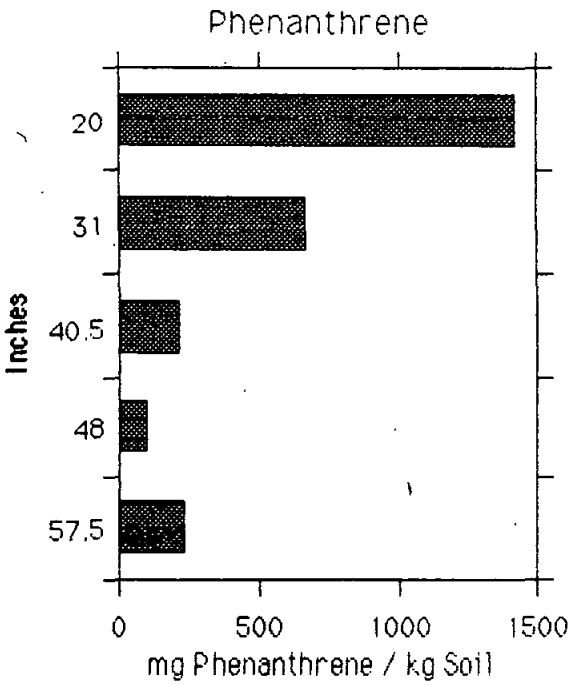


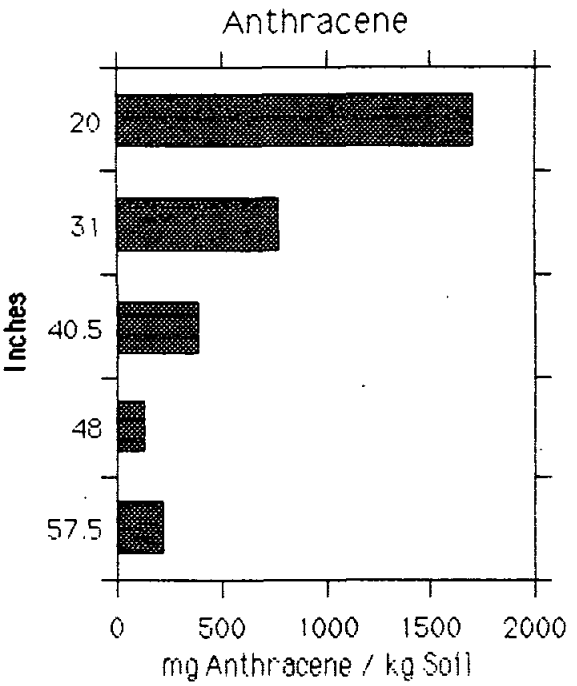


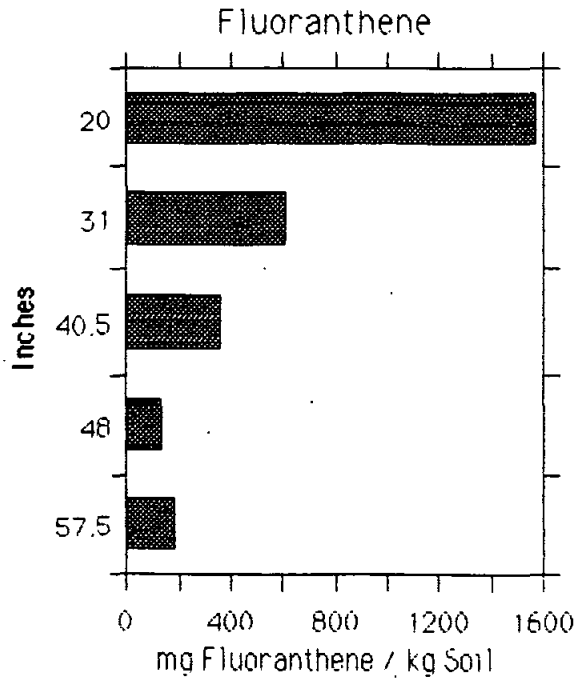


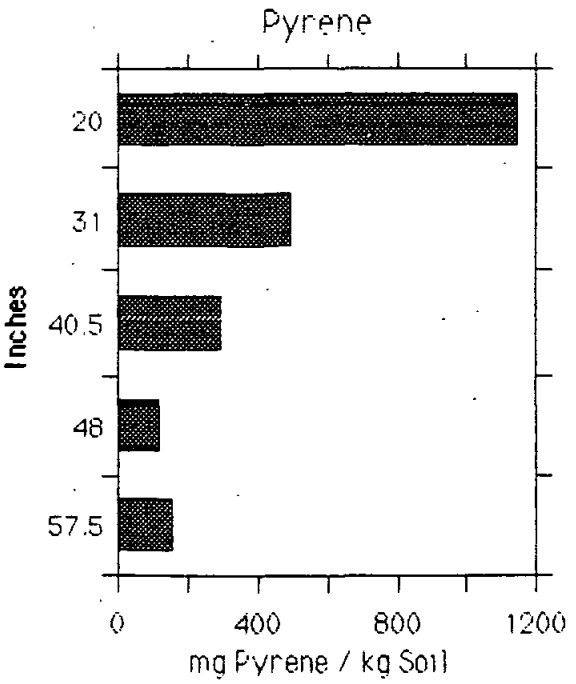


Reilly Site #1

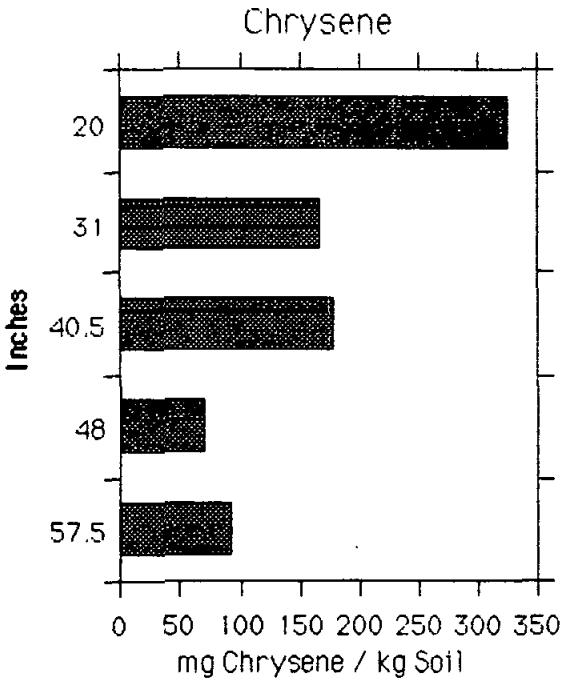


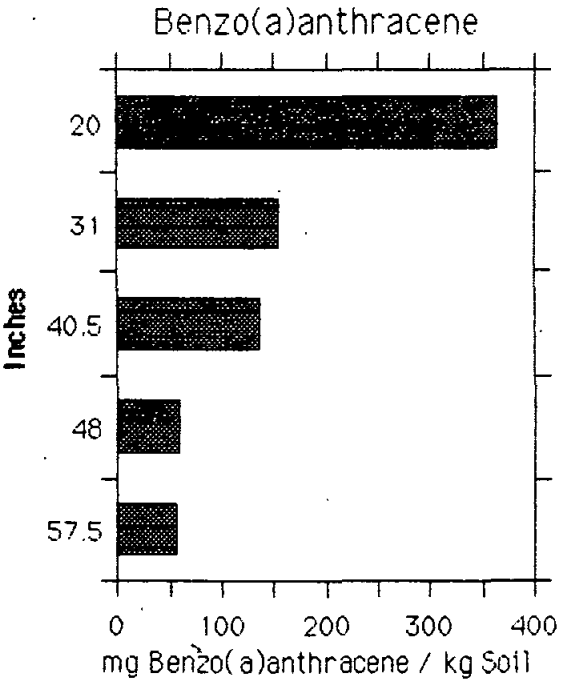






Reilly Site #1





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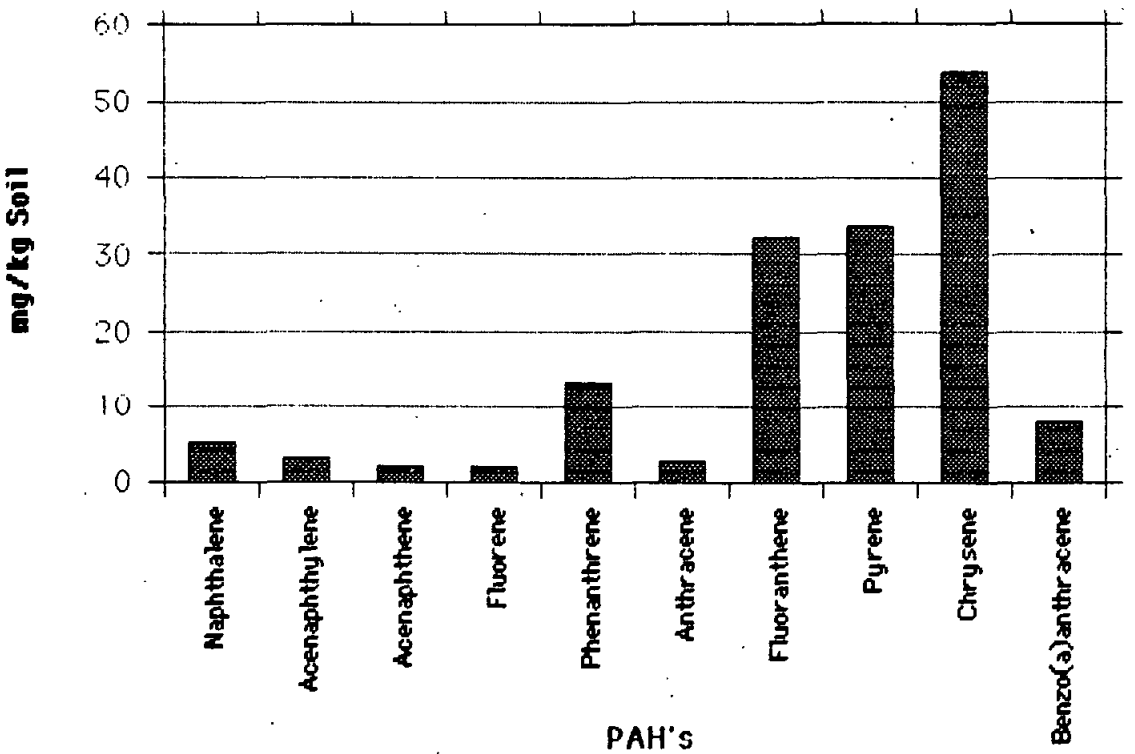

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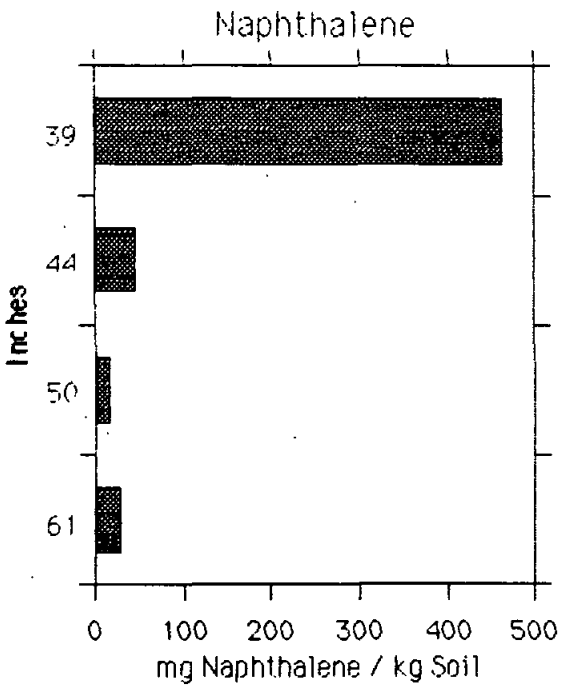

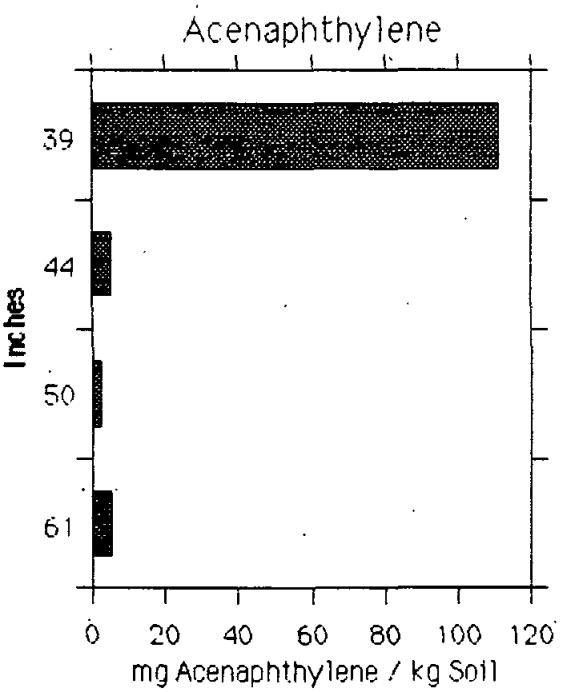

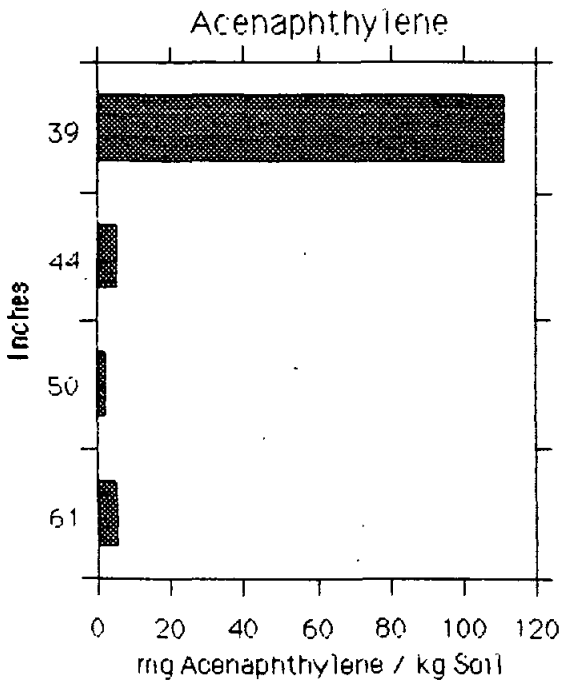

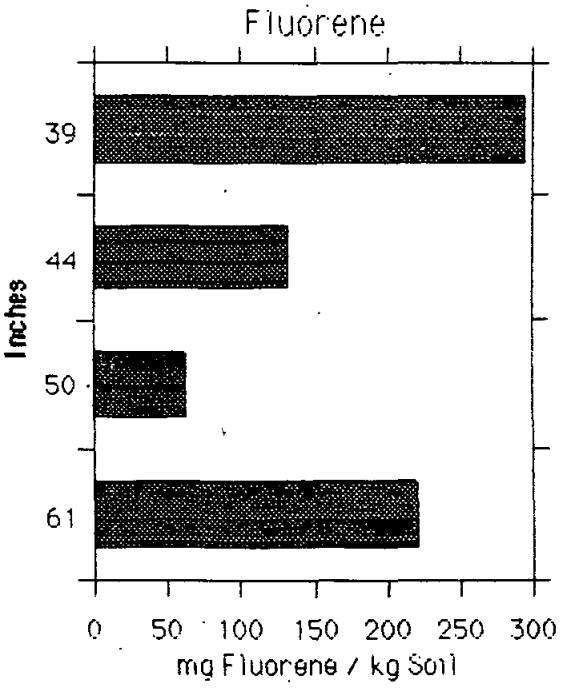

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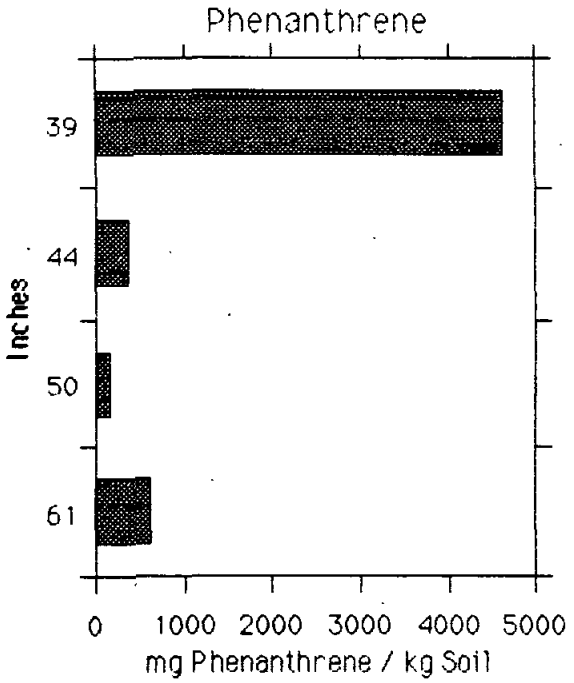
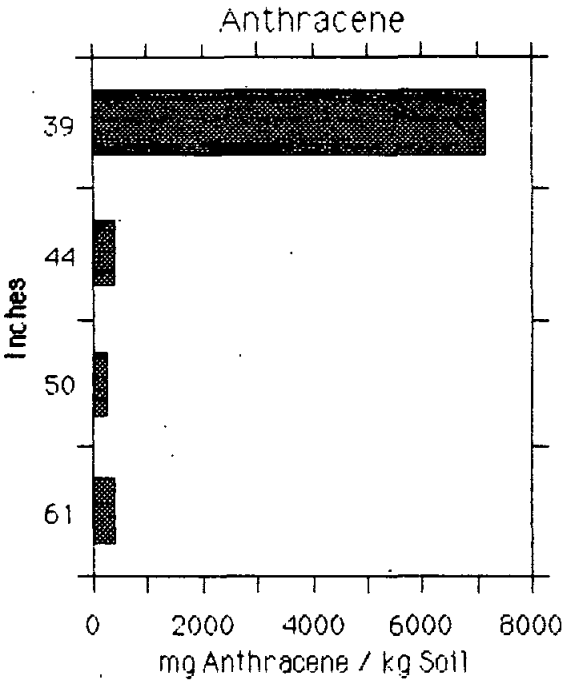
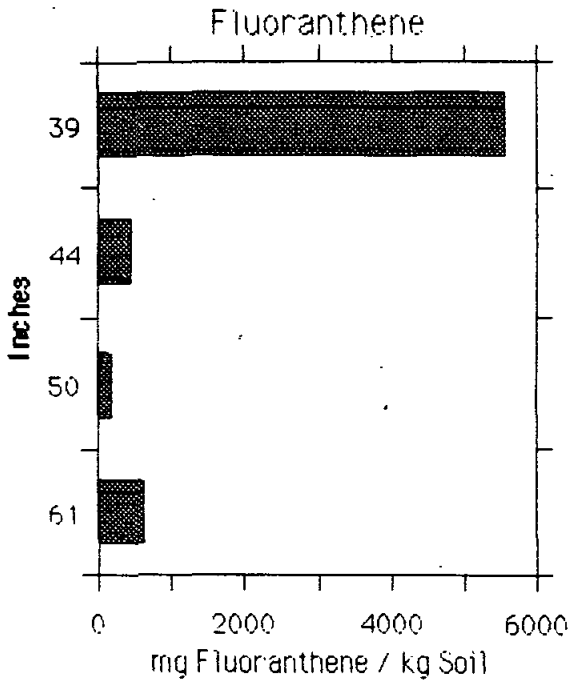
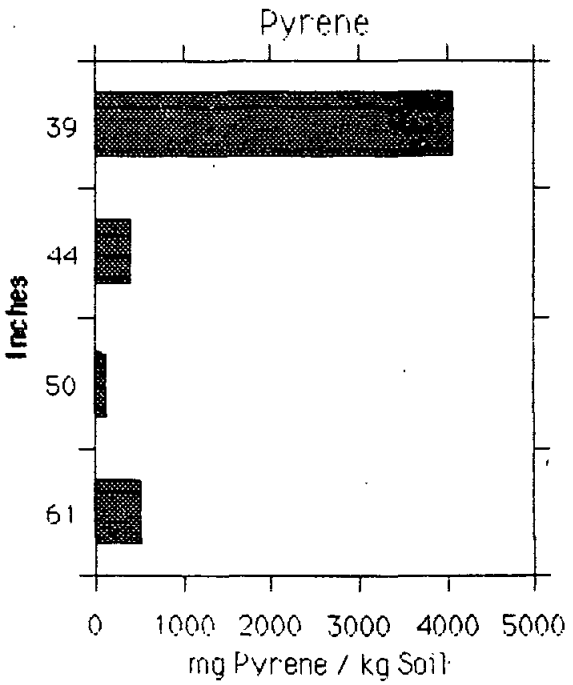
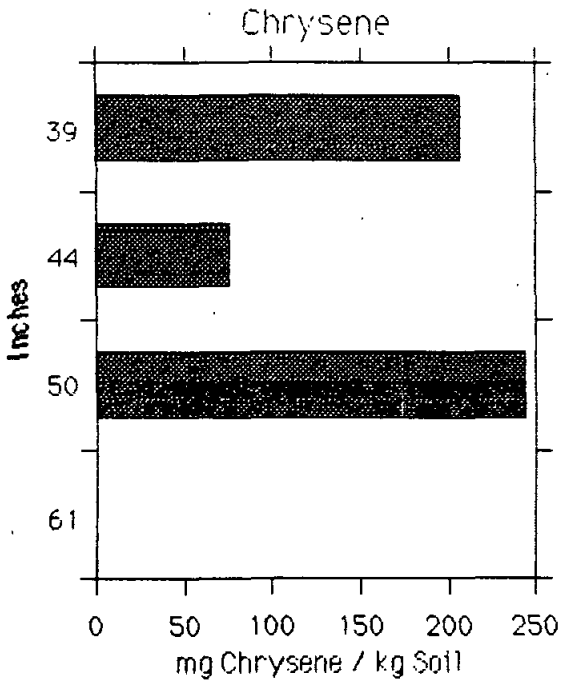


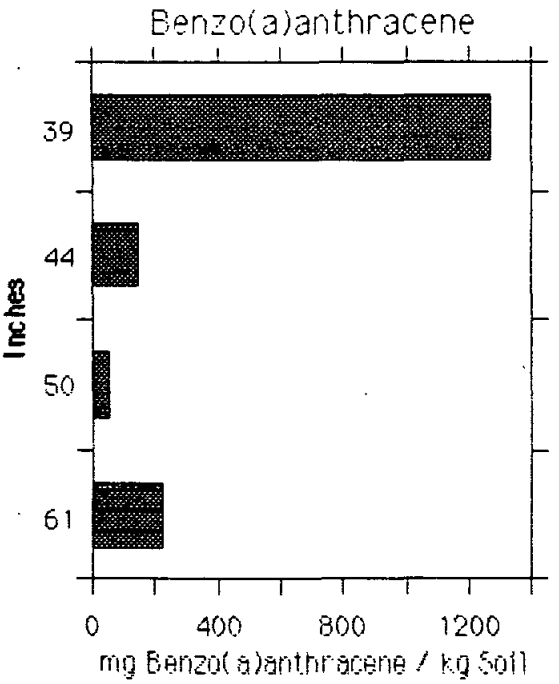






Reilly Site #3





File Memorandum on Reilly Site Sampling, October 9, 1991

Prepared by Le T. Thai

Date: October 30, 1991

The purposes of the predrilling excursion on October 9, 1991, were: (1) to investigate the possible presence and extent of debris on Mound Reilly, as the debris, if it does exist, would have to be avoided during future drilling for core samples; and (2) to locate sites with high enough levels of contamination for worthwhile drilling of core samples.

Three sites were chosen during this predrilling trip to be investigated as possible drilling sites. The first was on Mound Reilly, the second on the flat area between Mound Reilly and the pond, and the third was south of Walker Street and north of Highway 7. The drilling was done by a MPCA drill rig with a hollow stem auger. Between drillings at different sites, the auger was cleaned with a solution of phosphate detergent and water.

The first drill site was on Mound Reilly (all drill sites are shown on the accompanying map). The depth profile is as follows:

- The top foot beneath the grass was made up of fine tan clay
- The next 7 to 8 feet (i.e. to depth of 8 to 9 feet below ground) consisted of black medium to coarse sand
- From depth of around 9 to depth of 14 feet, the soil graded into a medium to fine-grained black clay (fill)
- Starting at a depth of about 14 feet, there were coarse small stones mixed in with the black fill. This mixture extended down to a depth of 16 feet where we encountered about 5 feet of coarse to medium grained fill mixed with fine silty clay

- Coarse alluvium of pea sized to 1-inch diameter stones in fine to medium black sand made up the rest of the drill depth. Drilling was stopped at the 29-foot depth where the ambient air concentration of volatile organics was 19 ppm.

After boring and sampling were completed, the hole (here as at the other two sites, also) was filled with cuttings mixed with bentonite.

At several depths, OVM readings were taken. OVM readings are measures of volatile organics concentration in the soil. At this site, volatile organics concentration increased to a peak of 84 ppm at a depth of around 8 feet, decreased to 55 ppm at 14 feet, and increased again to a maximum reading of 125 ppm around the 29-foot depth where drilling was stopped.

At all three sites, soil samples were taken at several depths. Duplicate samples were taken from the material brought up by the auger drills after stopping the auger at certain depths. These samples, which were stored in 8-ounce size glass containers with aluminum foil-lined screw caps, were transported to the laboratory in an ice chest and then stored in a constant temperature room set at 4°C. The samples were labeled according to their respective sites and depths. The soil samples will be analyzed for identification of contaminants and these analyses will help determine the depths at which core samples will be taken.

At Site 1 duplicate soil samples were taken at approximately every five-foot interval during the drilling, starting at the 4-foot depth, and ending at the 29-foot depth. In addition, duplicate samples were taken at the 25-foot depth after the auger was pulled out after drilling was completed.

The second drill site is located on the area between Mound Reilly and the pond (see accompanying map). The depth profile is as follows:

- Dark organic fill made up the first 2 feet (topsoil)
- Below the top 2 feet, the soil changed to a tan, medium to coarse-grained sand mixed with gravel down to a depth of 19 feet where drilling was stopped.

As at Site 1, OVM readings were taken at several depths. At this site, however, the readings were much lower than at Site 1, with a reading of 0.4 ppm in the top soil, increasing to a peak of 2 ppm at the 10-foot depth, and leveling out again to 1 ppm at the 19-foot depth.

Duplicate soil samples were taken at depths of 4, 9, and 14 feet. Also, samples were taken at the 18-foot depth after the auger was pulled out of the ground after drilling.

Site 3 is located south of Walker Street, and north of Highway 7. This site, which was mainly peat, was highly contaminated. OVM readings were 90 ppm at the 6-foot depth, and 137 ppm at the 8-foot depth. Duplicate samples were taken at 2.5, 4, and 8 feet.

As mentioned above, all the soil samples will be analyzed (by Soxhlet extraction and gas chromatography) for identification of contaminants. From the drilling, it can be concluded there are sites for core samplings, namely, the site south of Walker Street and the site on Mound Reilly. The chemical analyses of the samples obtained at these sites will help determine at which depths core samples will be taken during the next drilling trip.

MINNESOTA POLLUTION CONTROL AGENCY

EPA ID NO.

PROJECT Reilly TAR

LOG OF BORING NO. #SB-1

DEPTH FEET	DESCRIPTION (SOIL TYPE, GRAIN SIZE, COLOR, MOISTURE CONTENT, ETC.)	GEOLOGY	BLOW COUNT	SAMPLE TYPE	REC. INCHES	HNu or OVA READING	OTHER
1	grass - 1 foot buff to tan fine to silty clay	Top Soil		Flight auger			
2	Very black medium to coarse grained sand, moth ball	fill				4.5 ppm	
3							
4							
5	Same					54. ppm	
6							
7							very strong odor
8	grading into a medium to fine grained very dirty (black) clay.						
9						84 ppm	
10							
11	grading back into a coarse to fine grained black fill	fill					
12							
13	Same						
14							
15	very coarse, small stones up to 2 inches, very dirty black fill	fill				55 ppm	
16							
17	coarse to medium grained fill, very black, mixture						
18	of clay, very fine silty clay						
19							
20	Same grading into					Turn	
21	fine sand to finer distinct	coarse alluvium				Over	

DEPTH : DRILLING METHOD			WATER LEVEL MEASUREMENTS						
Hollow Stem Auger			DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
MECH Drill Rig			10/19						
BORING	DATE	TIME							
START	10/19/	10:00AM						18'.3"	
COMPLETE	10/1								

SURFACE ELEVATION

LOG BY PDN

OTHER Hole ... soil ...

Geology -

OVM

22 very coarse, pea size
23 to small stones.
greasy texture, odorous,
24 grading into a blacker (dark) pebbles.

Coarse Alluvium

79 ppm.

25.

26 same intermixing
fine to medium black sands
27. looks like
28 old lake deposit.

125ppm.

29.

30

31.

MINNESOTA POLLUTION CONTROL AGENCY

EPA ID NO.
PROJECT Kelly TAR

LOG OF BORING NO. SB # 2

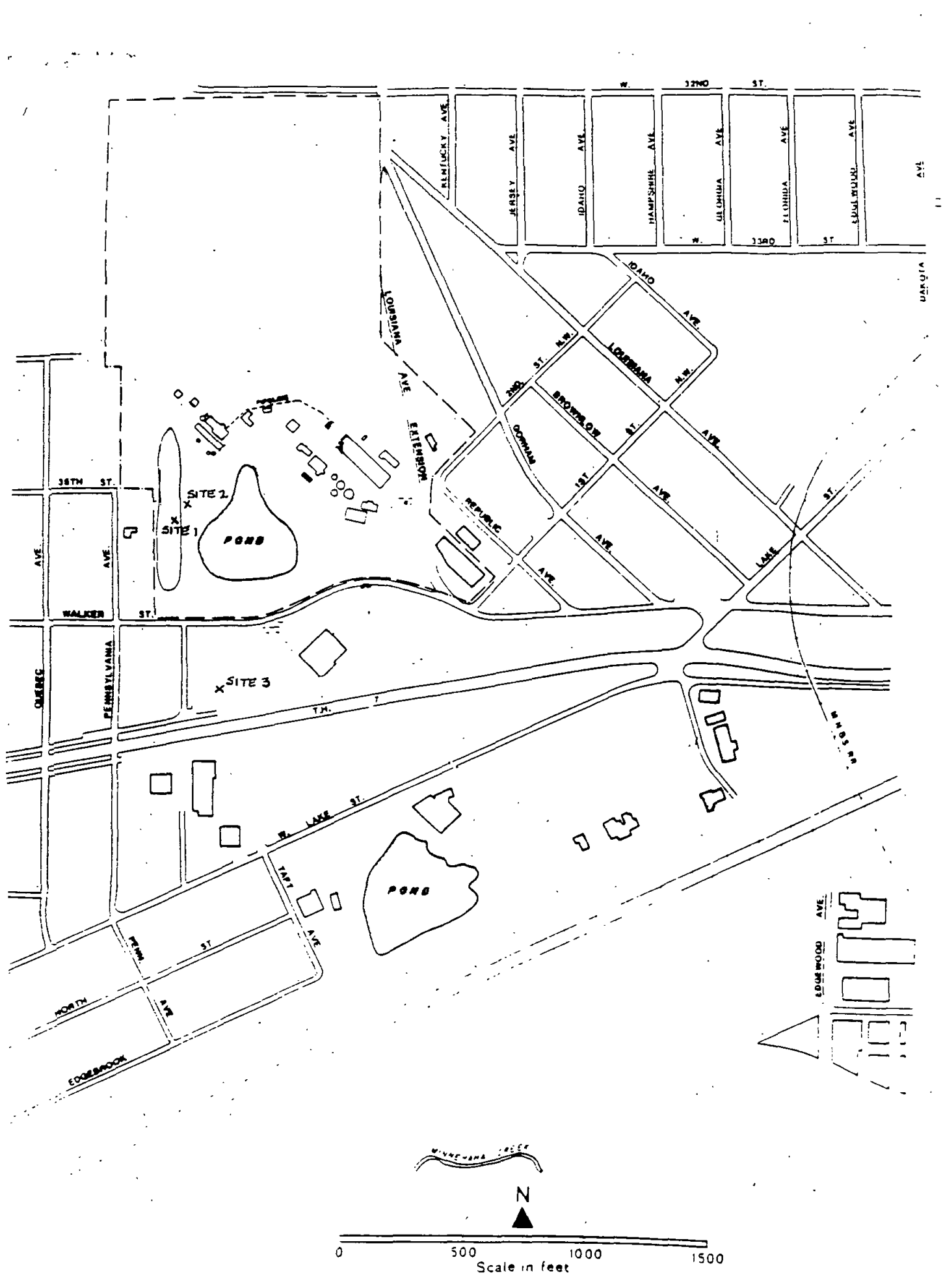
DEPTH FEET	DESCRIPTION (SOIL TYPE, GRAIN SIZE, COLOR, MOISTURE CONTENT, ETC.)	GEOLOGY	BLOW COUNT	SAMPLE TYPE	REC. INCHES	HNu or OVA READING	OTHER
1	Dark ogenic fill (top soil)	fill					.4 ppm
2							
3	Buff to Tan medium to coarse grained sandy gravel						
4							
5	Buff to tan	?					1 ppm
6	medium to coarse grained gravel. Very greasy	(fill)					
7							
8	texture.						
9							
10	Same	Native Alluvium (course)					2 ppm
11							
12	Hit Water ▼						
13	Same.						
14							
15	grading into						
16	a pea to small						
17	stones. Very greasy						
18	texture						
19							
20							
21							

DEPTH : DRILLING METHOD			WATER LEVEL MEASUREMENTS						
Hollow Stem Auger			DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
for Test Pit							4.5		
BORING	DATE	TIME							
START	10/9/91	11:15							
COMPLETE	10/9/91	11:35							

SURFACE ELEVATION _____

LOG BY _____

OTHER Hole filled with cuttings & bentonite


W. 32ND ST.
KENTUCKY AVE.
JERSEY AVE.
IDAHO AVE.
HAMPSHIRE AVE.
W. 33RD ST.
ULOOMIA AVE.
FLORIDA AVE.
EDGEWOOD AVE.
DAKOTA AVE.
IDAHO AVE.
LOUISIANA AVE. N.W.
LOUISIANA AVE. EXTENSION
2ND ST. N.W.
BROOKLYN ST.
GORHAM
1ST AVE.
REPUBLIC AVE.
LAKE ST.
38TH ST.
SITE 2
SITE 1
POND
WALKER ST.
QUEBEC AVE.
PENNSYLVANIA AVE.
SITE 3
T.H. 7
W. LAKE ST.
TAFT AVE.
POND
PENN. AVE.
NORTH
EDGEBROOK
EDGEWOOD AVE.
MISS. RR.
WINNEHAHA CREEK
N
0
500
1000
1500
Scale in feet

Slurry Type Bench-Scale Biodegradation Study

Prepared by Jian-Shin Chen

Date : November 12, 1991

Slurry type biodegradation involves the treatment of contaminated soil materials in a contained system. The rate and extent of biodegradation is more manageable and predictable within contained system than other biotreatment process. This is due to a variety of factors including the following: (1) mixing and intimate contact of microorganisms with contaminated soil and (2) maintenance of optimum conditions (pH, dissolved oxygen, nutrients, substrate bioavailability, etc.) for biodegradation process. Slurry type experiment therefore offer special advantages for the investigation of contaminated soil.

The objective of this study is to investigate, at the bench-scale level, the potential of long-term biodegradation of contaminants in selected soil samples from Reilly Tar Site. Tests will be carried out without addition of inoculum and after addition of laboratory prepared enrichment cultures. It is important to understand the biodegradation potential of local microorganism before introducing any foreign microbes. The measurement of oxygen utilization in a modified BOD test is a simple and sensitive method for evaluating both the biodegradability of a substrate and the ability of a particular microbial population to metabolize a substrate. Hach Manometric BOD Apparatus will be used to monitor oxygen utilization. The rate and extent of biodegradation of soluble PAHs in the water phase will also be monitored. Removal of pollutants from contaminated soil will be determined by taking soil samples periodically.

The data will be analyzed using monod growth rate functions that correlate the rate of microbial growth, utilization of oxygen, and disappearance of organic chemical.

Soil sample. On October 9, 1991, subsurface soil samples were collected from the Reilly Tar Site. Sampling locations and procedures are described in a 10/30/91 memo by Le Thai. Three sites were chosen during this predrilling trip and soil samples from two sites were used in this experiment. One sample was collected at depth about 13-14 feet from the site on Mound Reilly. This soil graded into a medium to fine-grained black clay (fill) with an OVM reading of 55 ppm. OVM readings are measures of volatile organics concentration in the soil. The second soil sample was collected from the flat area between Mound Reilly and the pond at a depth of 9 feet with an OVM reading of about 2 ppm and contained mixture of medium to coarse-grained sand and gravel.

Laboratory enrichment culture. The culture was enriched from the soil from Bemidji Oil Spill Site in Minnesota. Kauser Jahan developed this mixed culture to biodegrade phenanthrene under controlled condition.

Experimental design. Bench-scale biotreatability study were conducted using Hach Manometric BOD Apparatus. A measured sample of both contaminated soil and buffer medium are placed into the BOD bottles and the each bottle is connected to a closed end mercury manometer.

Four 1-g soil samples from each location were placed into individual bottles for a total of eight samples. Four treatment were established for soil samples from different locations : (1) no inoculation, (2) no inoculation but with addition of 0.2% of sodium azide, (3) inoculated and (4) inoculated with addition of 0.2 % sodium azide. At the time of loading, 270 mL of buffer medium (5000 mg/L $NaNO_3$; 650 mg/L K_2HPO_4; 170 mg/L KH_2PO_4; 100 mg/L $MgSO_4.7H_2O$; 27.5 mg/L $CaCl_2.2H_2O$; 0.25 mg/L $FeSO_4$; pH adjusted to 7.1) and 30 mL of cell solution were added to the bottles with inoculation treatment and 300 mL buffer medium was added to bottles without inoculation treatment. The appropriate amount of

dry sodium azide was added to bottles with (2) and (4) treatments. The air space above the solution was initially filled with air which contains 21% oxygen. Over a period of time, either local or added bacteria in the bottle utilized oxygen to oxidize organic compounds present in the soil sample. The air in the closed sample bottle is replenished periodically as oxygen removal results in a drop in air pressure in the sample bottle. The pressure drop is registered on the mercury manometer which can be read directly as ppm BOD. The sample is continually agitated during the test period by a magnetic stirring bar which is rotated by means of a pulley system connected to an external motor. An open cup placed in the bottle containing lithium hydroxide absorbs carbon dioxide produced by the oxidation of organic compounds. The air is flushed and replaced periodically and reading of the manometer was taken before aeration. Oxygen utilization is read from the manometer periodically.

Bottles were sampled following every aeration of batch culture operation. Samples were obtained by manually removing 5 mL of medium from each bottle with a clean, sterile glass pipet. Duplicate 2.5-mL samples of medium from each bottle were used to perform a liquid extraction and GC analysis.

The tests were started on October 30, 1991 and are continuing.